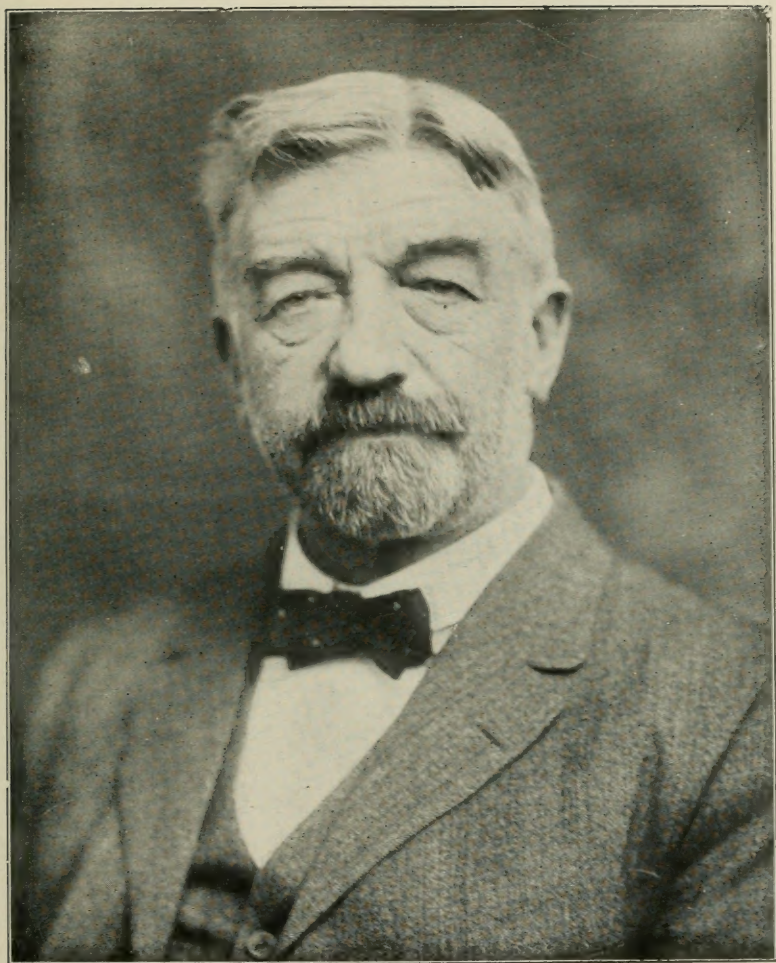


ALFRED ROBERT LOUIS DOHME.

PRESIDENT OF THE AMERICAN PHARMACEUTICAL ASSOCIATION 1917-1918, SUCCEEDING THE LATE CHARLES HOLZHAUER.

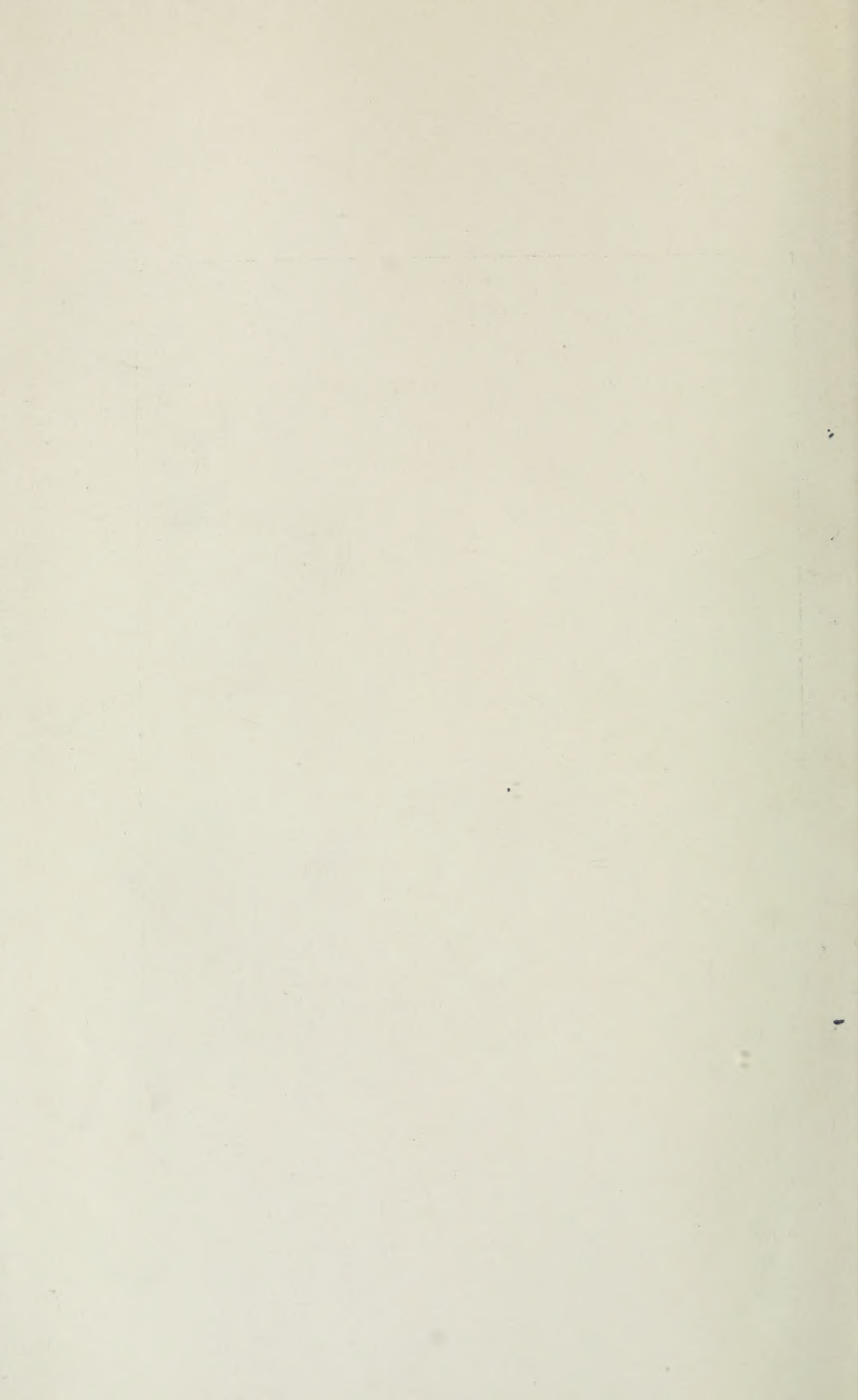
Dr. A. R. L. Dohme was born in Baltimore in 1867, and is a son of Charles E. Dohme, deceased, President of the American Pharmaceutical Association 1898-1899. A sketch will be found on p. 1036 in Volume VI, JOURNAL A. Ph. A.; his presidential address is printed on p. 663 of Volume VII. He is now a member of the Council, A. Ph. A.



CHARLES HOLZHAUSER.

SIXTY-FIFTH PRESIDENT OF THE AMERICAN PHARMACEUTICAL ASSOCIATION.

The parents of Charles Holzhauser came from Cassel, Germany, in 1848, when he was three years of age. They settled in Newark, N. J., which city continued to be his home until his demise, November 19, 1917. For sketch of Charles Holzhauser see p. 3, Volume VI, JOURNAL A. Ph. A., also p. 1033 of same volume. He was installed as President of the American Pharmaceutical Association at the Indianapolis meeting, September 1, 1917.



YEAR BOOK

OF THE

AMERICAN PHARMACEUTICAL ASSOCIATION

1917

Volume 6

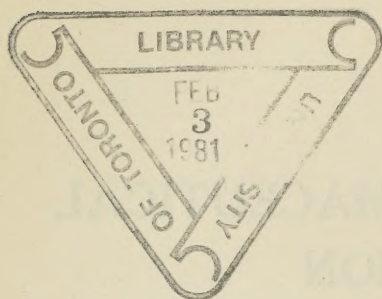
CONTAINING THE SIXTIETH ANNUAL REPORT
ON THE PROGRESS OF PHARMACY, AND
THE CONSTITUTION, BY-LAWS,
AND ROLL OF MEMBERS

CORRESPONDING TO VOLUME SIXTY-FIVE OF THE
FORMER PROCEEDINGS OF THE
AMERICAN PHARMACEUTICAL ASSOCIATION

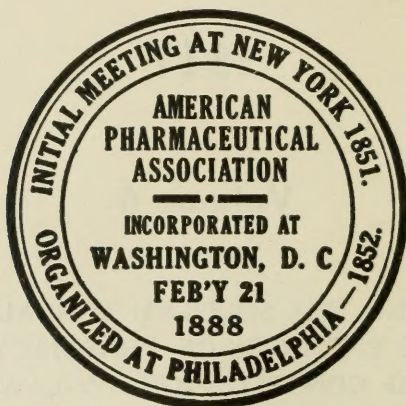
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1919

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Organized: Philadelphia, 1852.

Incorporated: Washington, D. C., 1888.

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WILLIAM MITTELBACH, Boonville, Mo.....	Term expires	1925
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Burlington.

E. W. GILMAN, Marshfield.

WILFRED F. ROOT, Brattleboro.

HENRY A. SLADE, Montpelier.

Massachusetts—THEODORE J. BRADLEY,
Chairman, Boston.

WILLIAM S. BRIRY, Melrose.

A. J. BRUNELLE, Fall River.

J. F. CORREA, Jr., Boston.

ERNST O. ENGSTROM, Pittsfield.

IRVING P. GAMMON, Brookline.

C. F. NIXON, Leominster.

Rhode Island—HERBERT HAYNES, *Chairman*,
Providence.

J. E. BRENNAN, Pawtucket.

E. P. ANTHONY, Providence.

M. H. CORRIGAN, Providence.

BENJAMIN F. DOWNING, Newport.

District No. 2.—Chairman—JEANNOT HOSTMANN, 115 W. 68th St., New York, N. Y. *Including*
—New York, Pennsylvania, New Jersey, Delaware, Maryland, Virginia, West Virginia, Dis-
trict of Columbia.

New Jersey—GEORGE S. CAMPBELL, *Chair-*
man, Milburn.

HENRY A. JORDEN, Bridgeton.

EDGAR R. SPARKS, Burlington.

HARRY W. CROOKS, Newark.

Virginia—W. F. RUDD, *Chairman*, Richmond.

MAUDE LAMBERT, Roanoke.

MORRIS PHIPPS, Richmond.

C. H. GOLDSBOROUGH, Culpeper.

West Virginia—B. E. DOWNS, *Chairman*,
Welch.

ALFRED WALKER, Sutton.

G. O. YOUNG, Buckhannon.

New York—J. LEON LASCOFF, *Chairman*,
New York.

L. BERGER, New York.

EDWARD S. DAWSON, JR., Syracuse.

GEORGE C. DIEKMANN, New York.

JACOB DINER, New York.

OTTO RAUBENHEIMER, Brooklyn.

GEORGE REIMANN, Buffalo.

FREDERICK P. TUTHILL, Brooklyn.

Maryland—C. L. MEYER, *Chairman*, Balti-
more.

JAMES A. BLACK, Baltimore.

ALBERT L. PEARRE, Frederick.

GEORGE E. PEARCE, Frostburg.

DONALD F. STAM, Arlington.

District of Columbia—LOUIS FLEMER, *Chair-*
man, Washington.

S. L. HILTON, Washington.

H. E. KALUSOWSKI, Washington.

Delaware—JOHN O. BOSLEY, *Chairman*,
Wilmington.

REUBEN M. KAUFMAN, Seaford.

HERBERT K. WATSON, Wilmington.

Pennsylvania—P. H. UTECH, *Chairman*,
Meadville.

C. H. LAWALL, Philadelphia.

JOSEPH W. ENGLAND, Philadelphia.

CHARLES F. KRAEMER, Harrisburg.

WALTER ROTHWELL, Hatboro.

LOUIS SAALBACH, Pittsburgh.

L. L. WALTON, Williamsport.

*District No. 3.—Chairman—*LEONARD A. SELTZER, 32 Adams Street, West, Detroit, Michigan.
Including—Ohio, Indiana, Illinois, Kentucky, Michigan and Wisconsin.

Illinois—WM. GRAY, *Chairman*, Chicago.
PAUL G. SCHUH, Cairo.
W. S. DENTON, Beardstown.
C. C. ORR, Chicago.
Ohio—EDWARD SPEASE, *Chairman*, Cleveland
WALDO M. BOWMAN, Toledo.
LEWIS C. HOPP, Cleveland.
THEO. D. WETTERSTROEM, Cincinnati.
Indiana—F. W. MEISSNER, JR., *Chairman*,
La Porte.
C. B. JORDAN, Lafayette.
EMIL REYER, South Bend.
W. H. RUDDER, Salem.
R. L. GREEN, Notre Dame.

Kentucky—C. S. PORTER, *Chairman*, Lexington.
ADDISON DIMMITT, Louisville.
J. W. GAYLE, Frankfort.
EDWARD L. PIECK, Covington.
JOSEPH B. WELSH, Paducah.
Michigan—MARTIN H. GOODALE, *Chairman*,
Battle Creek.
A. A. WHEELER, Detroit.
WILLIAM C. KIRCHGESSNER, Grand Rapids.
HARRY B. MASON, Detroit.
Wisconsin—E. S. THATCHER, *Chairman*,
Milwaukee.
SOLOMON A. ECKSTEIN, Milwaukee.
EDWARD WILLIAMS, Madison.

*District No. 4.—Chairman—*JAMES O. BURGE,* 1502 McGavock Street, Nashville, Tenn.
Including—North Carolina, South Carolina, Tennessee, Georgia, Alabama, Mississippi,
Florida, Arkansas, Louisiana, Oklahoma, Texas, Panama, Cuba, and West Indies.

Alabama—CARL WHORTON, *Chairman*,
Gadsden.
W. E. BINGHAM, Tuscaloosa.
BERNHARD H. EICHOID, Mobile.
LAWRENCE C. LEWIS, Tuskegee.
W. P. THOMASON, Guntersville.
Arkansas—JOHN S. GIBSON, *Chairman*, Hope.
WILLIAM L. DEWOODY,* Pine Bluff.
M. A. EISELE, Hot Springs.
FRANK SCHACHLEITER, Little Rock.
Cuba—JOSE GUILLERMO DIAZ, *Chairman*,
Havana.
JOSE P. ALACAN, Havana.
FRANCISCO HERRERA, Havana.
Florida—E. BERGER, *Chairman*, Tampa.
WM. D. JONES, Jacksonville.
D. W. RAMSAUR, Palatka.
Georgia—ROBERT H. LAND, JR., *Chairman*,
Augusta.
SINCLAIR S. JACOBS, Atlanta.
R. A. ROWLINSKI, Savannah.
ROBERT THOMAS, JR., Thomasville.
Louisiana—PHILIP ASHER, *Chairman*, New
Orleans.
FABIUS C. GODBOLD, New Orleans.
ADAM WIRTH, New Orleans.
R. F. GRACE, New Orleans.

Mississippi—HENRY M. FASER, *Chairman*,
University.
GUS C. KENDALL, Meridian.
J. C. MCGEE, Jackson.
Texas—ROBERT H. WALKER, *Chairman*,
Gonzales.
HEERMAN A. NESTER, San Antonio.
J. M. FLETCHER, Dallas.
HARRY DEATHE, Cooper.
Panama—BOLIVAR JURADO, *Chairman*,
Panama City.
OSWALD CHAPMAN, Panama City.
Oklahoma—J. C. BURTON, *Chairman*, Stroud.
EDWIN DEBARR, Norman.
FRANK A. DINKLER, Hennessey.
North Carolina—K. E. BENNETT, *Chairman*,
Bryson City.
CHARLES P. GREYER, Morgantown.
JOHN H. HARDIN, Wilmington.
EDWARD V. ZOELLER, Tarboro.
South Carolina—JOSEPH B. HYDE, *Chairman*,
Charleston.
HENRY PLENGE, Charleston.
W. H. ZEIGLER, Charleston.
Tennessee—WILLIAM R. WHITE, *Chairman*,
Nashville.
IRA B. CLARK, Nashville.
J. E. JUSTICE, Clarksville.
T. J. SHANNON, Sharon.
F. W. WARD, Memphis.
E. W. WRIGHT, Memphis.

*District No. 5.—Chairman—*WILBER J. TEETERS, Iowa College of Pharmacy, Iowa City, Iowa.
Including—Missouri, Iowa, Kansas, Nebraska, Minnesota, North Dakota, and South
Dakota.

Iowa—G. SCHERLING, *Chairman*, Sioux City.
ELBERT O. KAGY, Des Moines.
JOHN M. LINDLY, Des Moines.
AL. FALKENHAINER, Algona.
Missouri—H. M. WHELPLEY, *Chairman*,
St. Louis.
R. A. DOYLE, East Prairie.
HENRY D. LLEWELLYN, Mexico.
WM. MITTELBACH, Booneville.
D. V. WHITNEY, Kansas City.
FRANCIS HEMM, St. Louis.
Kansas—L. D. HAVENHILL, *Chairman*,
Lawrence.
J. S. CHISM, Wichita.
MAXIMILIAN W. FRIEDENBURG, Winfield.
EDWARD DORSEY, Ottawa.

Minnesota—E. L. NEWCOMB, *Chairman*,
Minneapolis.
WILLIAM A. ABBETT, Duluth.
WM. A. FROST, St. Paul.
CHAS. H. HUHN, Minneapolis.
ROBERT L. MORLAND, Worthington.
Nebraska—AUTUMN V. PRASE, *Chairman*,
Fairbury.
HENRY R. GERING, Omaha.
EDMOND O. HASCHENBURGER, Lincoln.
R. A. LYMAN, Lincoln.
North Dakota—W. P. PORTERFIELD, *Chairman*,
Fargo.
BURT FINNEY, Bismarck.
HENRY L. HAUSSAMEN, Grafton.
South Dakota—DAVID F. JONES, *Chairman*,
Watertown.
H. A. KEITH, Lake Preston.
FRANK D. KRIEBS, Beresford.
GEORGE F. SWARTZ, Moleridge.
E. C. BENT, Dell Rapids.

* Deceased.

*District No. 6.—Chairman—*JOSEPH L. LENGFELD, 272 Post Street, San Francisco, California.
Including—California, Nevada, Utah, Colorado, New Mexico.

California—JOSEPH L. LENGFELD, *Chairman*,
San Francisco.

FRANKLIN T. GREEN, San Francisco.
FRED. I. LACKENBACH, San Francisco.
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Colorado—W. T. HOVER, *Chairman*, Denver.
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FRANCIS J. PERUSSE, Boulder.

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Elko.

W. R. ENGLERT, Elko.
New Mexico—BERNARD C. RUPPE, *Chairman*,
Albuquerque.

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Utah—W. H. DAYTON, *Chairman*, Salt Lake
City.

JOHN CULLEY, Ogden.
W. L. EDDY, Brigham City.

*District No. 7.—Chairman—*JOHN M. A. LAUE, 175 3rd Street, Portland, Oregon. Including—
Washington, Oregon, Idaho, Montana, Wyoming, Alaska.

Idaho—H. H. WHITTELEY, *Chairman*,
Pocatello.

CLARENCE O. BALLOU, Boise.
ROY M. SPARGUR, Twin Falls.
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WALTER W. QUILLIAN, Oakley.

Oregon—C. M. MCKELLIPS, *Chairman*,
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GEORGE C. BLAKELEY, The Dalles.
ADOLPH ZIEFLE, Corvallis.
J. LEE BROWN, Marshfield.
LOUIS G. CLARKE, Portland.

Alaska—GUY L. SMITH, *Chairman*, Douglas.
ZACHARY J. LOUSSAC, Anchorage.
WM. E. BRITT, Juneau.

Montana—CHARLES E. F. MOLLETT, *Chairman*,
Missoula.

CHAS. J. CHAPPLE, Billings.
FRED WOEHNER, Great Falls.

Washington—CHARLES W. JOHNSON, *Chairman*,
Seattle.

FRED MARR, Tacoma.
MRS. EMILY C. MCRAE, Spokane.
CORNELIUS OSSEWARD, Seattle.
A. W. LINTON, Seattle.

*District No. 8.—British America, Chairman—*CHARLES F. HEEBNER, Ontario College of Pharmacy, Toronto, Ontario.

ALEXANDER B. J. MOORE, Montreal, Quebec. HENRY E. J. BLETCHER, Winnipeg, Manitoba.
ALEXANDER STEWART, Guelph, Ontario.

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* Deceased

LIST OF OFFICERS OF THE ASSOCIATION SINCE ITS ORGANIZATION

(NAMES OF DECEASED OFFICERS IN ITALICS)

Date.	Place of Meeting.	Presidents.	First Vice-Presidents.	Second Vice-Presidents.	Third Vice-Presidents.
Oct. 6, 1852	Philadelphia, Pa.....	<i>Daniel B. Smith</i> , Philadelphia.	<i>George W. Andrews</i> , Baltimore.	<i>Samuel M. Colcord</i> , Boston.	<i>C. Augustus Smith</i> , Cincinnati.
Aug. 24, 1853	Boston, Mass.....	<i>William A. Brewer</i> , Boston.	<i>George D. Coggeshall</i> , New York.	<i>Alexander Duval</i> , Richmond, Va.	<i>Charles B. Gulhrie</i> , Memphis, Tenn.
July 25, 1854	Cincinnati, O.....	<i>William B. Chapman</i> , Cincinnati.	<i>Henry T. Cummings</i> , Portland, Me.	<i>John Meakin</i> , New York.	<i>Joseph Laidley</i> , Richmond, Va.
Sept. 11, 1855	New York, N. Y.....	<i>John Meakin</i> , New York.	<i>Charles B. Gulhrie</i> , Memphis, Tenn.	<i>Charles Ellis</i> , Philadelphia.	<i>Henry F. Fish</i> , Waterbury, Conn.
Sept. 9, 1856	Baltimore, Md.....	<i>George W. Andrews</i> , Baltimore.	<i>John I. Kidwell</i> , Washington, D. C.	<i>Fredrick Stearns</i> , Detroit, Mich.	<i>Henry T. Kiersted</i> , New York.
Sept. 8, 1857	Philadelphia, Pa.....	<i>Charles Ellis</i> , Philadelphia.	<i>James Cooke</i> , Fredericksburg, Va.	<i>Samuel P. Peck</i> , Bennington, Vt.	<i>A. E. Richards</i> , Plaquemine, La.
Sept. 14, 1858	Washington, D. C....	<i>John I. Kidwell</i> , Georgetown, D. C.	<i>Edward R. Squibb</i> , Brooklyn, N. Y.	<i>James O'Gallagher</i> , St. Louis.	<i>Robert Batley</i> , Rome, Ga.
Sept. 13, 1859	Boston, Mass.....	<i>Samuel M. Colcord</i> , Boston.	<i>William Procter, Jr.</i> , Philadelphia.	<i>Joseph Roberts</i> , Baltimore.	<i>Edwin O. Gale</i> , Chicago.
Sept. 11, 1860	New York, N. Y.....	<i>Henry T. Kiersted</i> , New York.	<i>William J. M. Gordon</i> , Cincinnati.	<i>William S. Thompson</i> , Baltimore.	<i>Theodore Metcalf</i> , Boston.
Aug. 27, 1862	Philadelphia, Pa.....	<i>Wm. Procter, Jr.</i> , Philadelphia.	<i>John Milhan</i> , New York.	<i>Eugene L. Massol</i> , St. Louis.	<i>J. Faris Moore</i> , Baltimore.
Sept. 8, 1863	Baltimore, Md.....	<i>J. Faris Moore</i> , Baltimore.	<i>John M. Maisch</i> , Philadelphia.	<i>Chas. A. Tufts</i> , Dover, N. H.	<i>George W. Weyman</i> , Pittsburgh.
Sept. 21, 1864	Cincinnati, O.....	<i>William J. M. Gordon</i> , Cincinnati.	<i>Richard H. Stabler</i> , Alexandria.	<i>Enno Sander</i> , St. Louis.	<i>Thomas Hollis</i> , Boston.

LIST OF OFFICERS (Continued)

Date.	Place of Meeting.	Presidents.	First Vice-Presidents.	Second Vice-Presidents.	Third Vice-Presidents.
Sept. 5, 1865	Boston, Mass.....	<i>Henry W. Lincoln</i> , Boston.	<i>George C. Close</i> , Brooklyn, N. Y.	<i>Elijah W. Sackrider</i> , Cleveland, O.	<i>Charles A. Heintsh</i> , Lancaster, Pa.
Aug. 22, 1866	Detroit, Mich.....	<i>Frederick Stearns</i> , Detroit, Mich.	<i>Edward Parrish</i> , Philadelphia.	<i>Ezekiel H. Sargent</i> , Chicago.	<i>John W. Shelden</i> , New York.
Sept. 10, 1867	New York, N. Y.....	<i>John Milhan</i> , New York.	<i>Robert J. Brown</i> , Leavenworth, Kans.	<i>N. Hynson Jennings</i> , Baltimore.	<i>Daniel Henchman</i> , Boston.
Sept. 8, 1868	Philadelphia, Pa.....	<i>Edward Parrish</i> , Philadelphia.	<i>Ferris Bringham</i> , Wilmington, Del.	<i>Edward S. Wayne</i> , Cincinnati.	<i>Albert E. Ebert</i> , Chicago.
Sept. 7, 1869	Chicago, Ill.....	<i>Ezekiel H. Sargent</i> , Chicago.	<i>Ferdinand W. Senne- wald</i> , St. Louis.	<i>John J. Pope</i> , New Orleans.	<i>Joel S. Orne</i> , Cambridgeport, Mass.
Sept. 13, 1870	Baltimore, Md.....	<i>Richard H. Stabler</i> , Alexandria, Va.	<i>Fleming G. Grieve</i> , Milledgeville, Ga.	<i>James G. Steele</i> , San Francisco.	<i>Eugene L. Massot</i> , St. Louis.
Sept. 12, 1871	St. Louis, Mo.....	<i>Enno Sander</i> , St. Louis.	<i>C. Lewis Diehl</i> , Louisville, Ky.	<i>George F. H. Markoe</i> , Boston.	<i>Matthew F. Ash</i> , Jackson, Miss.
Sept. 3, 1872	Cleveland, O.....	<i>Albert E. Ebert</i> , Chicago.	<i>Samuel S. Garrigues</i> , East Saginaw, Mich.	<i>Edward P. Nichols</i> , Newark, N. J.	<i>Henry C. Gaylord</i> , Cleveland, O.
Sept. 16, 1873	Richmond, Va.....	<i>John F. Hancock</i> , Baltimore.	<i>William Saunders</i> , London, Ont.	<i>John T. Buck</i> , Jackson, Miss.	<i>Paul Balluff</i> , New York.
Sept. 8, 1874	Louisville, Ky.....	<i>C. Lewis Diehl</i> , Louisville, Ky.	<i>Joseph Roberts</i> , Baltimore.	<i>William T. Wenzell</i> , San Francisco.	<i>Augustus R. Bayley</i> , Cambridgeport, Mass.
Sept. 7, 1875	Boston, Mass.....	<i>George F. H. Markoe</i> , Boston.	<i>Frederick Hoffman</i> , New York.	<i>T. Roberts Baker</i> , Richmond, Va.	<i>Christian F. G. Meyer</i> , St. Louis.
Sept. 12, 1876	Philadelphia, Pa.....	<i>Charles Bullock</i> , Philadelphia.	<i>Samuel A. D. Shep- pard</i> , Boston.	<i>Gustavus J. Luhm</i> , Charleston, S. C.	<i>Jacob D. Wells</i> , Cincinnati.

LIST OF OFFICERS OF THE ASSOCIATION.

LIST OF OFFICERS (Continued)

Date.	Place of Meeting.	Presidents.	First Vice-Presidents.	Second Vice-Presidents.	Third Vice-Presidents.
Sept. 4, 1877	Toronto, Can.....	<i>William Saunders</i> , London, Ont.	<i>Ewen McIntyre</i> , New York.	<i>John Ingalls</i> , Macon, Ga.	<i>Emlen Painter</i> , San Francisco.
Nov. 26, 1878	Atlanta, Ga.....	<i>Gustavus J. Luhn</i> , Charleston, S. C.	<i>Frederick T. Whiting</i> , Great Barrington, Mass.	<i>Henry J. Rose</i> , Toronto, Can.	<i>William H. Crawford</i> , St. Louis.
Sept. 9, 1879	Indianapolis, Ind.....	<i>George W. Sloan</i> , Indianapolis, Ind.	<i>T. Roberts Baker</i> , Richmond, Va.	<i>Joseph L. Lemberger</i> , Lebanon, Pa.	<i>Philip C. Candidus</i> , Mobile, Ala.
Sept. 14, 1880	Saratoga, N. Y.....	<i>James T. Shinn</i> , Philadelphia.	<i>George H. Schafer</i> , Fort Madison, Ia.	<i>William S. Thompson</i> , Washington, D. C.	<i>William Simpson</i> , Raleigh, N. C.
Aug. 23, 1881	Kansas City, Mo.....	<i>P. Wendover Bedford</i> , New York.	<i>Emlen Painter</i> , San Francisco.	<i>George Leis</i> , Lawrence, Kans.	<i>John F. Judge</i> , Cincinnati.
Sept. 12, 1882	Niagara Falls, N. Y...	<i>Charles A. Heinitzsch</i> , Lancaster, Pa.	<i>John Ingalls</i> , Macon, Ga.	<i>Louis Dobme</i> , Baltimore.	<i>William B. Blanding</i> , Providence, R. I.
Sept. 11, 1883	Washington, D. C.....	<i>William S. Thompson</i> , Washington, D. C.	<i>Charles Rice</i> , New York.	<i>Frederick H. Masi</i> , Norfolk, Va.	<i>Edward W. Runyon</i> , San Francisco.
Aug. 26, 1884	Milwaukee, Wis.	<i>John Ingalls</i> , Macon, Ga.	<i>John A. Dadd</i> , Milwaukee, Wis.	<i>Henry Canning</i> , Boston.	<i>Charles F. Goodman</i> , Omaha, Neb.
Sept. 8, 1885	Pittsburgh, Pa.....	<i>Joseph Roberts</i> , Baltimore.	<i>Albert H. Hollister</i> , Madison, Wis.	<i>Albert B. Prescott</i> , Ann Arbor, Mich.	<i>Joseph S. Evans</i> , West Chester, Pa.
Sept. 7, 1886	Providence, R. I.....	<i>Chas. A. Tufts</i> , Dover, N. H.	<i>Henry J. Menninger</i> , Brooklyn, N. Y.	<i>M. W. Alexander</i> , St. Louis.	<i>Norman A. Kahn</i> , Omaha, Neb.
Sept. 5, 1887	Cincinnati, O.....	<i>John U. Lloyd</i> , Cincinnati.	<i>M. W. Alexander</i> , St. Louis.	<i>A. K. Finlay</i> , New Orleans.	<i>Karl Simmon</i> , St. Paul, Minn.
Sept. 3, 1888	Detroit, Mich.....	<i>M. W. Alexander</i> , St. Louis.	<i>Jas. Vernor</i> , Detroit, Mich.	<i>Fred Wilcox</i> , Waterbury, Conn.	<i>Alvin A. Yeager</i> , Knoxville, Tenn.
June 24, 1889	San Francisco, Cal...	<i>Emlen Painter</i> , New York.	<i>Karl Simmon</i> , St. Paul, Minn.	<i>Wm. M. Searby</i> , San Francisco.	<i>Joseph W. Eckford</i> , Aberdeen, Miss.

LIST OF OFFICERS (Continued)

Date.	Place of Meeting.	Presidents.	First Vice-Presidents.	Second Vice-Presidents.	Third Vice-Presidents.
Sept. 8, 1890	Old Pt. Comfort, Va..	<i>A. B. Taylor</i> , Philadelphia,	<i>A. B. Stevens</i> , Ann Arbor, Mich.	<i>Chas. E. Dohme</i> , Baltimore,	<i>James M. Good</i> , St. Louis.
April 27, 1891	New Orleans, La.....	<i>A. K. Finlay</i> , New Orleans.	<i>Geo. J. Seabury</i> , New York.	<i>W. H. Torbert</i> , Dubuque, Ia.	<i>L. T. Dunning</i> , Sioux Falls, S. D.
July 14, 1892	Profile House, N. H....	<i>Jos. P. Remington</i> , Philadelphia.	<i>A. P. Preston</i> , Portsmouth, N. H.	<i>Sidney P. Watson</i> , Atlanta, Ga.	<i>Wm. H. Averill</i> , Frankfort, Ky.
Aug. 14, 1893	Chicago, Ill.....	<i>Edgar L. Patch</i> , Boston.	<i>Leo Elid</i> , South Bend, Ind.	<i>Wiley Rogers</i> , Louisville, Ky.	<i>Chas. Caspari, Jr.</i> , Baltimore.
Sept. 3, 1894	Asheville, N. C.....	<i>William Simpson</i> , Raleigh, N. C.	<i>Chas. M. Ford</i> , Denver, Colo.	<i>Jno. N. Hurty</i> , Indianapolis, Ind.	<i>Jas. E. Morrison</i> , Montreal, Can.
Aug. 14, 1895	Denver, Colo.....	<i>James M. Good</i> , St. Louis.	<i>Chas. E. Dohme</i> , Baltimore.	<i>A. Brandeburger</i> , Jefferson City, Mo.	<i>Mrs. M. O. Miner</i> , Hiawatha, Kans.
Aug. 12, 1896	Montreal, Can.....	<i>Joseph E. Morrison</i> , Montreal, Can.	<i>Geo. F. Payne</i> , Atlanta, Ga.	<i>Wm. A. Frost</i> , St. Paul, Minn.	<i>Geo. W. Parisen</i> , Perth Amboy, N. J.
Aug. 23, 1897	Lake Minnetonka, Minn.....	<i>Henry M. Whitney</i> , Lawrence, Mass.	<i>George C. Bartells</i> , Camp Point, Ill.	<i>Wm. S. Thompson</i> , Washington, D. C.	<i>Jacob A. Miller</i> , Harrisburg, Pa.
Aug. 29, 1898	Baltimore, Md.....	<i>Charles E. Dohme</i> , Baltimore.	<i>George F. Payne</i> , Atlanta, Ga.	<i>James H. Beal</i> , Scio, O.	<i>Josie A. Wanous</i> , Minneapolis, Minn.
Sept. 4, 1899	Put-in-Bay, O.....	<i>Albert B. Prescott</i> , Ann Arbor, Mich.	<i>Lewis C. Hopp</i> , Cleveland, O.	<i>Wm. L. Dewoody</i> , Pine Bluff, Ark.	<i>Henry R. Gray</i> , Montreal, Can.
May 7, 1900	Richmond, Va.....	<i>Jno. F. Patton</i> , York, Pa.	<i>James H. Beal</i> , Scio, O.	<i>Jno. W. Gayle</i> , Frankfort, Ky.	<i>E. A. Ruddiman</i> , Nashville, Tenn.
Sept. 16, 1901	St. Louis, Mo.....	<i>Henry M. Whelpley</i> , St. Louis.	<i>Wm. M. Seabury</i> , San Francisco.	<i>George F. Payne</i> , Atlanta, Ga.	<i>Wm. S. Thompson</i> , Washington, D. S.
Sept. 8, 1902	Philadelphia, Pa.....	<i>Geo. F. Payne</i> , Atlanta, Ga.	<i>Wm. L. Cliffe</i> , Philadelphia, Pa.	<i>Eugene G. Eberle</i> , Dallas, Texas.	<i>Henry Willis</i> , Quebec, Can.
Aug. 3, 1903	Mackinac Island, Mich.....	<i>Lewis C. Hopp</i> , Cleveland, O.	<i>Wm. C. Alpers</i> , New York.	<i>Albert M. Roehrig</i> , Stapleton, N. Y.	<i>Otto F. Claus</i> , St. Louis, Mo.

LIST OF OFFICERS (Continued)

Date.	Place of Meeting.	Presidents.	First Vice-Presidents.	Second Vice-Presidents.	Third Vice-Presidents.
Sept. 5, 1904	Kansas City, Mo.....	James H. Beal, Scio, O.	<i>Philip C. Candidus</i> , Mobile, Ala.	Wm. Mittelbach, Boonville, Mo.	Julius A. Koch, Pittsburgh, Pa.
Sept. 4, 1905	Atlantic City, N. J....	Jos. L. Lemberger, Lebanon, Pa.	<i>Chas. Holzhauser</i> , Newark, N. J.	Chas. A. Rapelye, Hartford, Conn.	Fabius C. Godbold, New Orleans, La.
Sept. 3, 1906	Indianapolis, Ind.....	<i>Leo Eliel</i> , South Bend, Ind.	Wm. Mittelbach, Boonville, Mo.	<i>C. S. N. Hallberg</i> , Chicago, Ill.	<i>Thomas P. Cook</i> , New York, N. Y.
Sept. 2, 1907	New York, N. Y.....	<i>Wm. M. Searby</i> , San Francisco, Cal.	<i>Oscar Oldberg</i> , Chicago, Ill.	Henry H. Rusby, New York, N. Y.	Oscar W. Bethea, Meridian, Miss.
Sept. 7, 1908	Hot Springs, Ark.....	<i>Oscar Oldberg</i> , Chicago, Ill.	Eugene G. Eberle, Dallas, Texas.	Wm. Mittelbach, Boonville, Mo.	James H. Beal, Scio, O.
Aug. 16, 1909	Los Angeles, Cal.....	Henry H. Rusby, Newark, N. J.	Clement B. Lowe, Philadelphia, Pa.	Chas. W. Johnson, Seattle, Wash.	Wm. B. Day, Chicago, Ill.
May 2, 1910	Richmond, Va.....	Eugene G. Eberle, Dallas, Texas.	Wm. B. Day, Chicago, Ill.	Otto F. Claus, St. Louis, Mo.	Leonard A. Seltzer, Detroit, Mich.
Aug. 14, 1911	Boston, Mass.....	John G. Godding, Boston, Mass.	W. Bodemann, Chicago, Ill.	Chas. M. Ford, Denver, Colo.	Ernest Berger, Tampa, Fla.
Aug. 19, 1912	Denver, Colo.....	William B. Day, Chicago, Ill.	Chas. M. Ford, Denver, Colo.	Caswell A. Mayo, New York, N. Y.	C. Herbert Packard, East Boston, Mass.
Aug. 18, 1913	Nashville, Tenn.	George M. Beringer, Camden, N. J.	Franklin M. Apple, Philadelphia, Pa.	Wm. S. Richardson, Washington, D. C.	L. D. Havenhill, Lawrence, Kans.
Aug. 24, 1914	Detroit, Mich.....	Caswell A. Mayo, New York, N. Y.	L. D. Havenhill, Lawrence, Kans.	C. Herbert Packard, East Boston, Mass.	Charles Gietner, St. Louis, Mo.
Aug. 9, 1915	San Francisco, Cal...	<i>Wm. C. Alpers</i> , Cleveland, O.	C. H. LaWall, Philadelphia, Pa.	E. A. Ruddiman, Nashville, Tenn.	Linwood A. Brown, Lexington, Ky.
Sept. 5, 1916	Atlantic City, N. J....	Fred. J. Wulling, Minneapolis, Minn.	Leonard A. Seltzer, Detroit, Mich.	Lucius E. Sayre, Lawrence, Kans.	Philip Asher, New Orleans, La.
Aug. 28, 1917	Indianapolis, Ind.....	<i>Charles Holzhauser</i> , Newark, N. J.	Alfred R. L. Dohme, Baltimore, Md.	Leonard A. Seltzer, Detroit, Mich.	Theodore J. Bradley, Boston, Mass.

HONORARY PRESIDENTS.

Philip C. Candidus, Mobile, Ala., 1907-08.
Samuel A. D. Sheppard, Boston, Mass.,
 1908-09.
Enno Sander, St. Louis, Mo., 1909-10.

Ewen McIntyre, New York, N. Y., 1910-11.
Henry Biroh, Chicago, Ill., 1911-12.
Thomas F. Main, New York, N. Y., 1912-13.
Albert B. Lyons, Detroit, Mich., 1913-14.

Geo. H. Schafer, Ft. Madison, Ia., 1914-15.
Fabius C. Godbold, New Orleans, La.,
 1915-16.
J. O. Burge, Nashville, Tenn., 1916-17.
W. L. Dewoody, Pine Bluff, Ark., 1917-18.

TREASURERS.

Alfred B. Taylor, Philadelphia, 1852-54.
Samuel M. Colcord, Boston, 1854-56 and
 1857-59.
James S. Aspinwall, New York, 1856-57.

Ashel Boyden, Boston, 1859-60.
Henry Haviland, New York, 1860-63.
J. Brown Basley, Baltimore, Md., 1863-65.
Charles A. Tufts, Dover, N. H., 1865-86.

Samuel A. D. Sheppard, Boston, 1886-1908.
Henry M. Whepley, St. Louis, 1908-18.

RECORDING SECRETARIES.

George D. Coggeshall, New York, 1852-53.
Edward Parrish, Philadelphia, 1853-54.
Edward S. Wayne, Cincinnati, 1854-55.

William J. M. Gordon, Cincinnati, 1855-59.
Charles Bullock, Philadelphia, 1859-60.
James T. Shinn, Philadelphia, 1860-62.

Peter W. Bedford, New York, 1862-63.
William Evans, Jr., Philadelphia, 1863-64.
Henry N. Rittenhouse, Philadelphia, 1864-65.

CORRESPONDING SECRETARIES.

William Procter, Jr., Philadelphia, 1852-53
 and 1854-57.
William B. Chapman, Cincinnati, 1853-54.
Edward Parrish, Philadelphia, 1857-58.

John M. Maisch, Philadelphia, 1862-63.

Ambrose Smith, Philadelphia, 1858-59.
William Hegeman, New York, 1859-60.
Peter W. Bedford, New York, 1860-62 and
 1863-65.

PERMANENT SECRETARIES.

John M. Maisch, Philadelphia, 1865-Sept., 1893.
Henry M. Whepley, St. Louis (acting), August, 1893.

Joseph P. Remington, Philadelphia, 1893-94.
Chas. Caspari, Jr., Baltimore, 1894-96.

GENERAL SECRETARIES.

Chas. Caspari, Jr., 1896-1911.

James H. Beal, Scio, Ohio, 1911-14.
Wm. B. Day, Chicago, Ill., 1914-18.

LOCAL SECRETARIES.

For the meeting held in	For the meeting held in
1867. <i>P. Wendover Bedford.</i>	1901. <i>H. M. Whepley.</i>
1868. <i>Alfred B. Taylor.</i>	1902. <i>William L. Cliffe.</i>
1869. <i>Henry W. Fuller.</i>	1903. <i>F. W. R. Perry.</i>
1870. <i>J. Farris Moore.</i>	1904. <i>Joseph C. Wirthman.</i>
1871. <i>William H. Crawford.</i>	1905. <i>William C. Westcott.</i>
1872. <i>Henry C. Gaylord.</i>	1906. <i>Frank H. Carter.</i>
1873. <i>Thomas H. Hazard.</i>	1907. <i>Thomas P. Cook.</i>
1874. <i>Emil Scheffer.</i>	1908. <i>Martin A. Eisele.</i>
1875. <i>Samuel A. D. Sheppard.</i>	1909. <i>Thomas W. Jones.</i>
1876. <i>Adolphus W. Miller.</i>	1910. <i>T. Ashby Miller.</i>
1877. <i>Henry J. Rose.</i>	1911. <i>C. Herbert Packard.</i>
1878. <i>Jesse W. Rankin.</i>	1912. <i>Charles M. Ford.</i>
1879. <i>Eli Lilly.</i>	1913. <i>James O. Burge.</i>
1880. <i>Charles F. Fish.</i>	1914. <i>Leonard A. Seltzer.</i>
1881. <i>William T. Ford.</i>	1915. <i>John H. Dawson.</i>
1882. <i>Hiram E. Griffith.</i>	1916. <i>Chas. Holzhauser.</i>
1883. <i>Charles Becker.</i>	1917. <i>Francis E. Bibbins.</i>
	1918. <i>E. N. Gathercoal.</i>

REPORTERS ON PROGRESS OF PHARMACY.

C. L. Diehl, Louisville, Ky., 1873-91 and 1895-1915. *Chas. Rice*, New York, N. Y., 1891-92. *Henry Kraemer*, Philadelphia, Pa., 1892-95.
J. A. Koch, Pittsburgh, Pa., 1915-16. *H. V. Arny*, New York, N. Y., 1916-18.

PAST AND PRESENT OFFICERS OF THE SECTIONS.

SECTION ON COMMERCIAL INTERESTS.		SECTION ON PROGRESS OF PHARMACY.	
Chairman.		Chairman.	
1887-88. <i>A. H. Hollister.</i>	<i>J. W. Colcord.</i>	1889-90. <i>Leo Ehel.</i>	<i>F. B. Kilmer.</i>
1888-89. <i>A. H. Hollister.</i>	<i>J. W. Colcord.</i>	1890-91. <i>Henry Canning.</i>	<i>W. L. Dewoody.</i>
		1891-91. <i>W. H. Torbert.</i>	<i>Arthur Bassett.</i>

Secretary.

PAST AND PRESENT OFFICERS OF THE SECTIONS (Continued).

<i>Chairman.</i>		<i>Secretary.</i>	
1892-93,	W. H. Torbert.	1888-89,	<i>Chairman.</i>
1893-94,	Wiley Rogers.	1889-90,	<i>Emilen Painter.</i>
1894-95,	Geo. J. Seabury.	1890-91,	Henry Whelpley.
1895-96,	Geo. J. Seabury.	1891-92,	E. L. Patch.
1896-97,	Lewis C. Hopp.	1892-93,	C. S. N. Hallberg.
1897-98,	Joseph Jacobs.	1893-94,	C. S. N. Hallberg.
1898-99,	Joseph Jacobs.	1894-95,	F. G. Ryan.
1899-00,	James M. Good.	1895-96,	C. M. Ford.
1900-01,	Charles A. Rapelye.	1896-97,	George B. Kauffman.
1901-02,	F. W. Meissner.	1897-98,	W. C. Alpers.
1902-03,	Thomas V. Wooten.	1898-99,	V. Coblentz.
1903-04,	Wm. L. Dewoody.	1899-00,	A. B. Lyons.
1904-05,	Charles R. Sherman.	1900-01,	H. V. Army.
1905-06,	Henry P. Hynson.	1901-02,	Caswell A. Mayo.
1906-07,	Herman D. Kniseley.	1902-03,	Lyman F. Kebler.
1907-08,	Jacob Diner.	1903-04,	Jos. W. England.
1908-09,	Harry B. Mason.	1904-05,	Eustace H. Gane.
1909-10,	Waldo M. Bowman.	1905-06,	Charles E. Caspari.
1910-11,	Franklin M. Apple.	1906-07,	Daniel Base.
1911-12,	Ernest Berger.	1907-08,	Virgil Coblentz.
1912-13,	Autumn V. Pease.	1908-09,	Chas. E. Vanderkleed.
1913-14,	C. G. Lindvall and H. B. Mason.	1909-10,	<i>Martin I. Wilbert.</i>
1914-15,	E. H. Thiesing.	1910-11,	Albert H. Clark.
1915-16,	R. S. Lehmann.	1911-12,	Wm. O. Richtmann.
1916-17,	P. Henry Utech.	1912-13,	Charles H. LaWall.
1917-18,	Robt. P. Fischelis.	1913-14,	Freeman P. Stroup.
SECTION ON SCIENTIFIC PAPERS.		1914-15,	Wilbur L. Scoville.
<i>Chairman.</i>		1915-16,	William Mansfield.
		1916-17,	E. L. Newcomb.
		1917-18,	W. W. Stockberger.
		<i>Secretary.</i>	
		A. B. Lyons.	
		H. C. Fuller.	

PAST AND PRESENT OFFICERS OF THE SECTIONS (Continued).

SECTION ON PHARMACEUTICAL EDUCATION.

*Chairman.**Secretary.*

- 1887-88. *R. F. Bryant.*
 1888-89. *C. W. Day.*

SECTION ON PHARMACEUTICAL LEGISLATION.

*Chairman.**Secretary.*

- 1887-88. *John F. Judge.*
 1888-89. *P. W. Bedford.*

SECTION ON PHARMACEUTICAL EDUCATION AND LEGISLATION.

*Chairman.**Secretary.*

- 1889-90. *P. W. Bedford.*
 1890-91. *William Simon.*
 1891-92. *A. B. Stevens.*
 1892-93. *R. G. Eccles.*
 1893-94. *R. G. Eccles.*
 1894-95. *James M. Good.*
 1895-96. *C. S. N. Hallberg.*
 1896-97. *C. S. N. Hallberg.*
 1897-98. *James H. Beal.*
 1898-99. *A. B. Lyons.*
 1899-00. *C. B. Lowe.*
 1900-01. *C. B. Lowe.*
 1901-02. *E. G. Eberle.*
 1902-03. *J. W. T. Knox.*
 1903-04. *Harry B. Mason.*
 1904-05. *Harry B. Mason.*
 1905-06. *Oscar Oldberg.*

Chairman.

- 1906-07. *Oscar Oldberg.*
 1907-08. *Jos. W. England.*
 1908-09. *Jos. W. England.*
 1909-10. *Charles H. LaWall.*
 1910-11. *Charles W. Johnson.*
 1911-12. *John C. Wallace.*
 1912-13. *Wilber J. Teeters.*
 1913-14. *Hugh Craig.*
 1914-15. *F. H. Freericks.*
 1915-16. *F. H. Freericks.*
 1916-17. *R. A. Kuever.*
 1917-18. *C. B. Jordan.*

SECTION ON PRACTICAL PHARMACY AND DISPENSING.

Chairman.

- 1900-01. *H. P. Hynson.*
 1901-02. *F. W. E. Stedem.*
 1902-03. *Geo. M. Beringer.*
 1903-04. *William H. Burke.*
 1904-05. *Charles A. Rapelye.*
 1905-06. *Wm. C. Alpers.*
 1906-07. *H. A. Brown Dunning.*
 1907-08. *Franklin M. Apple.*
 1908-09. *Leonard A. Seltzer.*
 1909-10. *Otto Raubenheimer.*
 1910-11. *Louis Saalbach.*
 1911-12. *P. Henry Utech.*
 1912-13. *J. Leon Lascoff.*
 1913-14. *F. W. Nitardy.*

Secretary.

- Jos. W. England.*
Chas. H. LaWall.
Chas. H. LaWall.
Chas. W. Johnson.
W. J. Teeters.
W. J. Teeters.
Frank H. Freericks.
Frank H. Freericks.
R. A. Kuever.
R. A. Kuever.
C. B. Jordan.
W. F. Rudd.

Secretary.

- F. W. E. Stedem.*
William Kaemmerer.
William H. Burke.
E. A. Ruddiman.
Wm. C. Kirchgessner.
H. A. Brown Dunning.
Joseph Weinstein.
Joseph Weinstein.
E. Fullerton Cook.
Erich H. Ladish.
P. Henry Utech.
J. Leon Lascoff.
F. W. Nitardy.
Cornelius Osseward.

PAST AND PRESENT OFFICERS OF THE SECTIONS (Concluded).

<i>Chairman.</i>		<i>Secretary.</i>						
1914-15.....	Cornelius Osseward.	I. A. Becker.	1913-14.....	Wm. C. Alpers.	<i>Chairman.</i>	1913-14.....	Frederick T. Gordon.	<i>Secretary.</i>
1915-16.....	Joseph Weinstein.	H. B. SeCheverell.	1914-15.....	Frederick T. Gordon.	A. H. Clark.	1914-15.....	A. H. Clark.	
1916-17.....	W. H. Glover.	David Stolz.	1915-16.....	Charles Holschauer.	G. G. Marshall.	1915-16.....	G. G. Marshall.	
1917-18.....	Josiah C. Peacock.	R. W. Terry.	1916-17.....	W. L. DuBois.	L. E. Sayre.	1916-17.....	L. E. Sayre.	
SECTION ON HISTORICAL PHARMACY.			1917-18.....	L. E. Sayre.	Hugo Kantrowitz.	SECTION ON PHARMACOPOEIAS AND FORMULARIES.		
<i>Chairman.</i>		<i>Secretary.</i>		<i>Chairman.</i>		<i>Secretary.</i>		
1904-05.....	Albert E. Ebert.	Caswell A. Mayo.	1912-13.....	L. D. Havenhill.	F. Fullerton Cook.			
1905-06.....	John F. Hancock.	C. S. N. Hallberg.	1913-14.....	E. Fullerton Cook.	R. H. Needham.			
1906-07.....	Evan McIntyre.	Eugene G. Eberle.	WOMEN'S SECTION.					
1907-08.....	Edward V. Howell.	Eugene G. Eberle.	<i>Chairman.</i>					
1908-09.....	John B. Bond.	Eugene G. Eberle.	1912-14.....	Mrs. John G. Godding.	Miss Anna G. Bagley.	<i>Secretary.</i>		
1909-10.....	Eugene G. Eberle.	John A. Dunn.	1914-15.....	Mrs. John Culley.	Miss Anna G. Bagley.			
1910-11.....	Joseph L. Lemberger.	Otto Raubenheimer.	1915-16.....	Mrs. C. D. Timmons.	Miss Anna G. Bagley.			
1911-12.....	Otto Raubenheimer.	Caswell A. Mayo.	1916-17.....	Mrs. E. A. Ruddiman.	Mrs. Jean McKee Kenaston.			
1912-13.....	John G. Godding.	Frederick T. Gordon.	1917-18.....	Miss Zada Cooper.	Mrs. Jean McKee Kenaston.			

<i>Chairman.</i>		<i>Vice-Chairman.</i>	
1880-81.....	Jos. P. Remington.	Joseph Roberts.	George W. Kennedy.
1881-83.....	" "	Wm. J. M. Gordon.	" "
1883-84.....	" "	C. Lewis Diehl.	" "
1884-85.....	" "	John A. Dadd.	" "
1885-86.....	" "	C. Lewis Diehl.	" "
1886-87.....	Wm. S. Thompson.	H. J. Menninger.	" "
1887-88.....	Wm. H. Rogers.	Karl Simmon.	" "
1888-89.....	Jas. M. Good.	Emlen Painter.	" "
1889-90.....	" "	Wm. S. Thompson.	" "

LIST OF OFFICERS OF THE ASSOCIATION.

OFFICERS OF THE COUNCIL SINCE ITS FIRST ORGANIZATION (Concluded).

<i>Chairman.</i>		<i>Vice-Chairman.</i>	<i>Secretary.</i>
1890-92.	Jas. M. Good.	Wm. S. Thompson.	George W. Kennedy.
1892-94.	" "	H. M. Whitney.	" "
1894-95.	Wm. S. Thompson.	" "	" "
1895-96.	" "	Wm. C. Alpers.	" "
1896-1901.	" "	Jas. M. Good.	" "
1901-02.	A. B. Prescott.	Chas. E. Dohme.	" "
1902-03.	James H. Beal.	Lewis C. Hopp.	Henry M. Whelpley.
1903-04.	" "	Leo Eliel.	" "
1904-05.	" "	Jos. L. Lemberger.	" "
1905-06.	" "	Wm. C. Alpers.	" "
1906-08.	" "	Albert M. Roehrig.	" "
1908-09.	Jos. P. Remington.	Wm. S. Searby.	Joseph W. England.
1909-10.	Fabius C. Godbold.	Julius A. Koch.	" "
1910-11.	James H. Beal.	Henry H. Rusby.	" "
1911-12.	Eugene G. Eberle.	James M. Good.	" "
1912-13.	" "	Fabius C. Godbold.	" "
1913-16.	" "	J. C. Godding.	" "
1916-18.	Lewis C. Hopp.	S. L. Hilton.	" "

CONSTITUTION AND BY-LAWS

OF THE

American Pharmaceutical Association

(Revised to September 1, 1918, inclusive.)

CONSTITUTION

ARTICLE I. This Association shall be called the "American Pharmaceutical Association." Its aim shall be to unite the educated and reputable Pharmacists and Druggists of America in the following objects:

1. To improve and regulate the drug market by preventing the importation of inferior, adulterated, or deteriorated drugs and by detecting and exposing home adulterations.

2. To encourage such proper relations among Druggists, Pharmacists, Physicians and the people at large, as may promote the public welfare, and tend to mutual strength and advantage.

3. To improve the science and art of Pharmacy by diffusing scientific knowledge among Apothecaries and Druggists, fostering pharmaceutical literature, developing talent, stimulating discovery and invention, encouraging home production and manufacture in the several departments of the drug business.

4. To regulate the system of apprenticeship and employment, so as to prevent, as far as practicable, the evils flowing from deficient training in the responsible duties of preparing, dispensing, and selling medicines.

5. To suppress empiricism, and to restrict the dispensing and sale of medicines to regularly educated Druggists and Apothecaries.

6. To uphold standards of authority in the Education, Theory and Practice of Pharmacy.

7. To create and maintain a standard of professional honesty equal to the amount of our professional knowledge with a view to the highest good and greatest protection to the public.

ARTICLE II. This Association shall consist of active, life, and honorary members, and shall hold its meetings annually.

ARTICLE III. The officers of the Association shall be a President, three Vice-Presidents, a General Secretary, a Treasurer, and a Reporter on the Progress of Pharmacy, all of whom shall be elected annually; also a Local Secretary to be elected by the council. They shall hold office until an election of successors.

ARTICLE IV. All moneys received from life membership, together with such funds as may be bequeathed, or otherwise donated, to the Association, may be invested by the Treasurer in United States Government, State, Municipal, County or other securities acceptable as security for postal savings deposits, the interest of which for any current year only may be used by the Association for its expenses.

ARTICLE V. Every proposition to alter or amend this Constitution shall be printed in the JOURNAL at least thirty days prior to the annual meeting, shall be read at the first general session of the annual meeting, and shall be balloted upon at a subsequent general session, when, upon receiving the affirmative votes of two-thirds of the members present, it shall become a part of the Constitution. Any proposition to amend the Constitution for the purpose of permitting the expenditure of the permanent invested funds of the Association, shall require a majority of seven-eighths for its passage.

BY-LAWS

(Revised to September 1, 1918, inclusive.)

CHAPTER I.

Of the Election of Officers.

ARTICLE I. A Nominating Committee shall be annually chosen, whose duty it shall be annually, at the meeting, to select candidates for the offices of President, three Vice-Presidents and three members of the Council.

ARTICLE II. The Nominating Committee shall submit the names of three persons as candidates for each of the Offices of President, First Vice-President, Second Vice-President, Third Vice-president and three members of the Council. These names are to be submitted by the General Secretary by mail to every member of the Association within three months after he receives them, together with a request that the member indicate his preference on a ballot enclosed for that purpose, and return the same by mail within one month after its receipt.

ARTICLE III. The ballots received as indicated in the preceding article are to be sent by the General Secretary to a Board of Canvassers, composed of three members to be appointed by the President, who shall count as votes in the annual election only the votes of those members whose dues have been paid for the current year, and who in turn shall certify to the General Secretary the result of the election, after which the latter shall be published in the JOURNAL of the Association.

ARTICLE IV. The officers thus elected by a plurality of the votes cast shall be installed at the final general session of the next annual meeting.

ARTICLE V. The Honorary President, Reporter on the Progress of Pharmacy, the Treasurer and the General Secretary shall be elected annually by the Council.

CHAPTER II.

Of the President and Vice-Presidents.

ARTICLE I. The president shall preside at all general sessions of the Association, except those of the special Sections, as hereinafter provided. In the event of his absence or inability to serve, one of the Vice-Presidents, or in the absence of all, a President *pro tempore*, shall perform the duties of the President.

ARTICLE II. In the absence of the General Secretary, the President shall appoint a Recording Secretary *pro tempore*.

ARTICLE III. At the sessions the President shall take the chair at the proper time; announce all business; receive all proper motions, resolutions, reports and communications, and order the vote upon all proper questions at the proper time.

ARTICLE IV. In all balloting and on questions upon which the ayes and nays are taken, the President is required to vote, but his name shall be called last; in other cases he shall not vote, unless the members be equally divided, or unless his vote, if given to the minority, will make the decision equal; and in case of such equal division, the motion is lost.

ARTICLE V. He shall enforce order and decorum; it is his duty to hear all that is spoken in debate, and in case of personality and impropriety he shall promptly call the speaker to order. He shall decide all questions of order, subject to the right of appeal, unless in case where he prefers to submit the matter to the members; decide promptly who is to speak when two or more members rise at the same moment, and be careful to see that business is brought forward in proper order.

ARTICLE VI. He shall have the right to call a member to the chair, in order that he may take the floor in debate. He shall see that the Constitution and By-Laws are properly enforced.

ARTICLE VII. He shall appoint all committees not provided for in the By-Laws or otherwise directed by the Association. He shall announce the names of the appointees on such committees, as far as possible, at the time of his installation or within thirty days thereafter.

ARTICLE VIII. He shall sign the certificates of membership. He shall obey the instructions of the Association, and authenticate by his signature, when necessary, its proceedings.

ARTICLE IX. He shall present at each annual meeting an address, embodying general scientific facts and events of the year, or discuss such scientific questions as may to him seem suitable to the occasion.

CHAPTER III.

Of the General Secretary.

ARTICLE I. The General Secretary shall be elected annually and shall receive from the Treasurer an annual salary not to exceed \$1200, and the amount of his expenses incident to the meeting, in addition to his salary. He shall give bond for the proper disposition of the funds of the Association which may come into his hands, in such amount as may be prescribed by the Council.

ARTICLE II. He shall keep fair and correct minutes of the proceedings of the general session, and carefully preserve, on file, all reports, essays and papers of every description presented to the association, and shall be charged with the necessary foreign and scientific correspondence, and with the distribution of the Report on the Progress of Pharmacy under the direction of the Council.

ARTICLE III. He shall read all papers handed him by the President for that purpose, shall call and record the ayes and nays, whenever they are required to be called, shall notify the President, Local Secretary and the chairman of every standing and special committee of his election or appointment, giving each a statement of his duties and such other information as may be of service.

CHAPTER IV.

Of the Local Secretary.

ARTICLE I. The Local Secretary shall assist the General Secretary in his duties; shall co-operate with the Council and any Local Committee in making arrangements for the annual meeting; shall correspond with the chairman of the several committees, and with other members in advance of the meeting, for the promotion of its objects, and shall have the custody of specimens, papers and apparatus destined for use or exhibition at the meetings.

ARTICLE II. An exhibition of objects interesting to pharmacists may be held each year, should the Council so determine, under the direction of the Local Secretary and the Section on Commercial Interests.

CHAPTER V.

Of the Treasurer.

ARTICLE I. The Treasurer shall collect and take charge of the funds of the Association, and shall hold, sign, and issue the certificates of membership.

ARTICLE II. He shall pay no money except on the order of the General Secretary, accompanied by the proper vouchers.

ARTICLE III. He shall report to the Council, previous to each annual meeting, the names of such members as have failed to pay their annual dues for three years.

ARTICLE IV. He shall present a statement of his accounts at each annual meeting of the Council, that they may be audited; he shall receive an annual salary not to exceed \$1,000, and the amount of his expenses incident to the meeting, in addition to his salary.

ARTICLE V. The Treasurer, in order that he may qualify for the office to which he has been elected, shall file a good and sufficient bond or bonds for the amount of \$15,000 with the Chairman of the Council for the faithful performance of his duties as Treasurer, this bond or bonds to be signed and executed by a Trust Company acceptable to the Council.

CHAPTER VI.

Of the Reporter on the Progress of Pharmacy.

ARTICLE I. The Reporter on the Progress of Pharmacy shall be elected annually, and shall receive from the Treasurer for his services an annual salary not to exceed \$1,200.

ARTICLE II. All journals and volumes received in exchange for the Report on the Progress of Pharmacy by the General Secretary, and such other journals as shall be deemed necessary, shall be sent to him by that officer for use in the compilation of his report; for all of which he shall be held responsible until returned to the General Secretary for preservation.

ARTICLE III. From these and other available sources, he shall prepare a comprehensive report on the improvements and discoveries in Pharmacy, Chemistry and Materia Medica, and the collateral branches of knowledge; together with such data as will furnish an epitome of the progress and changes in the science and practice of Pharmacy, and of its votaries, at home and abroad.

ARTICLE IV. The Report on the Progress of Pharmacy shall be edited, published and distributed under rules and regulations approved by the Council. It shall be issued as a yearly volume, covering each fiscal year of the Association.

ARTICLE V. In case of the illness or other inability of the Reporter to carry on the work of the report, the General Secretary and the Chairman of the Council shall be required to make the best arrangements they can command to continue the work to its completion.

CHAPTER VII.

Of the Council.

ARTICLE I, *Section 1.* The business of the Association which is not of a scientific character shall be in charge of a Council, which is empowered to transact business for the Association between the times of meeting, to reduce any appropriations that have been made, whenever in their judgment the current receipts are not sufficient to allow the expenditure, and to perform such duties as may from time to time be committed to them by the Association; their acts, however, being subject to revision by the Association.

Section 2. Any member of the association may attend the meetings of the Council, and may, by permission of the presiding officer, be permitted to speak on any subject under discussion.

ARTICLE II. The Council shall consist of *ex-officio* members; one member from each local branch of this Association and nine other members, selected from such members as have had at least three years' membership in this Association, shall be elected by ballot by the Association in the following order: Three of them to serve for one year, three for two years, three for three years. At each subsequent annual meeting, three members shall be elected to take the place of those whose terms will then expire, to serve for the term of three years.

ARTICLE III. The President, Vice-Presidents, General Secretary, Local Secretary, Treasurer, Reporter on the Progress of Pharmacy, Editor-in-chief of the JOURNAL, the Chairman of the Sections of the Association, the Secretary of the Council, and the Historian of the Association shall be *ex-officio* members of the Council.

ARTICLE IV. Vacancies which may occur in the Council shall be filled for the unexpired term or terms by the Association at its next annual meeting.

ARTICLE V. The officers of the Council shall consist of a Chairman, Vice-Chairman, and a Secretary, to be elected by ballot annually by the Council.

ARTICLE VI. The Council shall be charged with the examination of the credentials of delegates, and the transaction of unfinished business of the Association from one annual meeting to another, and with collecting, arranging, and expediting the business of the Association during the sessions of the annual meeting.

ARTICLE VII. There shall be elected annually by ballot, by the Council, two standing committees of the Council—a Committee of Publication and a Committee on Finance—to whom shall be referred such duties as are appropriate to their respective functions, as the Council shall direct; they shall report annually to the Council, and at such other times as the Council may direct.

Whenever deemed advisable by the Council, it shall after the publication of each edition of the National Formulary appoint a committee of fifteen members from the general membership of the Association, which committee shall have charge of the revision of the Formulary. This committee shall report annually, or as often as required, to the Council, and shall continue to serve until the edition for which it was appointed has been completed. Vacancies occurring in this committee shall be filled by the Council as quickly as is expedient.

ARTICLE VIII, *Section 1*. The Council shall have charge of the revision of the roll of members, and the editing, publication and distribution of all the publications of the Association.

Section 2. The Secretary of the Council shall submit to the Council the names of the candidates who have been proposed for membership, when a majority vote shall be sufficient to elect them.

ARTICLE IX. The Council shall furnish to each member of the Association, not in arrears, one copy of the Report on the Progress of Pharmacy, which publication shall contain, in addition to the report, a list of the officers and committees, prefatory matter, constitution and by-laws, general rules, roll of members, list of members, and such other matter as may be deemed desirable by the Council. It shall fix, also, the price for which copies of the Report may be sold.

ARTICLE X. The Council shall issue a monthly journal, beginning in January, 1912, and thereafter, under rules and regulations to be adopted by the Council, and shall furnish copies of such publication to each member of the Association not in arrears for subscription. The publication shall contain editorials, original articles, the proceedings of the annual meetings, of the Council, and of the branches, and such other matter as may be deemed desirable by the Council.

CHAPTER VIII.

Of Membership.

ARTICLE I. Every pharmacist and druggist of good moral and professional standing whether in business on his own account, retired from business, or employed by another, and those teachers of Pharmacy, Chemistry and Botany who may be especially interested in Pharmacy and Materia Medica, also editors and publishers of pharmaceutical journals, who, after duly considering the objects of the Association and the obligations of the Constitution and By-Laws, subscribe to them, are eligible to membership; provided that any person whose name has been dropped from the roll of members for non-payment of dues may be re-admitted after having again made application in regular form, the application being accompanied by the usual fee; or he may be re-admitted, without such application, on payment of all back dues; in the latter case his membership shall date from the time when he first joined the Association, as previously printed in the Roll of Members, and notice of such action shall be inserted in the addendum to the Treasurer's report.

ARTICLE II. Every application for membership shall require the endorsement of two members of the Association in good standing, and each applicant must receive the affirmative vote of a majority of the members of the Council for election, after which his membership shall be completed by his signing the Constitution and By-Laws and paying the annual dues for the current year. Any newly elected member, upon the payment of annual dues for the year in which he is elected, shall be entitled to the annual volume of the Report on the Progress of Pharmacy and such other publications of the Association as are distributed to its members free of charge during the year. Any application for membership made during the fiscal year (the calendar year shall be the fiscal year of the Association) shall apply to the current fiscal year; except between June and January, when, if desired, it can be made to apply to the next fiscal year, if so stated on the application. The publications will be sent for the fiscal year in which the dues and subscription are credited.

The price for the Report on the Progress of Pharmacy to non-members shall be fixed by the Council. The subscription price for the JOURNAL of the Association shall be four dollars per annum to members and non-members alike. The subscription of the JOURNAL must be separate and distinct from the annual dues, although both may be paid at one and the same time.

ARTICLE III. Every member shall pay *in advance* to the Treasurer the sum of four dollars as annual dues, and by neglecting to pay said contribution for *six successive months*, may be dropped from the roll of members. If the annual dues (four dollars) and the annual subscription to the JOURNAL (four dollars) be paid at one and the same time, a reduction of three dollars shall be allowed.

ARTICLE IV. Any member of the Association who shall pay to the Treasurer the sum of \$100.00 during the first year of his connection therewith, and also any member not in arrears, who after ten years shall pay the sum of \$75.00, or after fifteen years the sum of \$50.00, or after twenty years the sum of \$40.00, or after twenty-five years the sum of \$25.00, and any member who may have paid annual dues for thirty-seven consecutive years, shall become a life-member, and shall be exempt from all future annual contributions.

ARTICLE V. All local and state organizations of Pharmacists shall be entitled to three delegates as their representative in the annual meeting, who, if present, become members of the Association on signing the Constitution and paying the annual contribution for the current year. Provided, that the provisions of this article shall not be so construed as to reinstate any member whose name shall have been dropped from the rolls for non-payment of dues, nor shall any one who has been expelled from the association be received as a delegate. All credentials shall be sent to the General Secretary at least two weeks in advance of the annual meeting.

ARTICLE VI. Members shall be entitled, on the payment of Three Dollars or of Five Dollars, to receive from the Treasurer, respectively, a paper or parchment certificate of membership signed by the President, one Vice-President, the General Secretary and the Treasurer.

ARTICLE VII. Resignations of membership shall be made in writing to the General Secretary or Treasurer, but no resignation shall be accepted from any one who is in arrears to the Treasury.

All resignations shall be acknowledged in writing by the officer who receives them, and shall be reported to the Council.

ARTICLE VIII. Any member may be expelled for improper conduct, or the violation of the Constitution, By-Laws, or Ethics, adopted by the Association, but no person shall be expelled unless he shall receive for expulsion two-thirds of all the votes cast at a general session.

ARTICLE IX. Pharmacists, chemists, and other scientific men who may be thought worthy the distinction, may be elected honorary members. They shall not, however, be required to contribute to the funds, nor shall they be eligible to hold office or vote at the meetings,

CHAPTER IX.

Of Meetings and Sections.

ARTICLE I. The meetings shall be held annually: Provided that in case of failure of this, from any cause, the duty of calling the Association together shall devolve upon the President, or one of the Vice-Presidents, with the advice and consent of the Council.

ARTICLE II. To expedite and render more efficient the work of the Association, the following Sections are provided:

1. Scientific Section, with four subdivisions: (a) Chemistry, (b) Botany and Pharmacognosy, (c) Biologic Assays, (d) Bacteriology.
2. Section on Commercial Interest.
3. Section on Practical Pharmacy and Dispensing.
4. Section on Pharmaceutical Legislation and Education.
5. Section on Historical Pharmacy.
6. Women's Section.

Upon the approval of the Council additional Sections may be organized from time to time as necessitated. Each Section, through its officers, shall solicit papers and propose suitable subjects for discussion at the annual meeting, arrange the business of the Section in advance, and perform such duties as may be referred to it. It shall make reports to the Council or Association if requested. The conduct of the work of each Section shall be under by-laws, rules and regulations approved by the Council. All committees proposed or appointed by the Sections shall be subject to the approval of the Council.

ARTICLE III. The business of the Association shall be arranged so that the labors of each Section shall be considered only at the session or sessions to which they are especially assigned.

ARTICLE IV. The first, second and last sessions of the annual meeting shall be devoted to the general business of the Association, and sufficient time shall be assigned to the Association at the beginning of all other sessions to read the minutes of the Council, act on the report of Council or membership, and receive propositions for amendments to the By-Laws.

ARTICLE V. A Chairman and Secretary shall be elected by ballot by each Section (except the Scientific Section which elects its officers in accord with the by-laws of said Scientific Section) to serve at the sessions of said Section. The minutes of each session, together with all documents and papers which belong to each Section, must be placed as soon as possible in the hands of the General Secretary for publication and safe-keeping.

ARTICLE VI. The Chairman of each Section (except the Scientific Section whose officers act in accord with the by-laws of said Scientific Section) shall preside at each of its sessions, and shall prepare a short address treating upon the subjects connected with his section, to be read before the Section at the annual meeting.

ARTICLE VII. The officers of the Section on Commercial Interests shall be charged with the work of arranging in advance the business to come before the Section at the next annual meeting; shall propose each year a subject for discussion at the meetings of the State Associations, and at the following annual meeting of the Association shall present a report of the action of the State Associations upon the subject proposed.

ARTICLE VIII. The Chairman of the Section on Practical Pharmacy and Dispensing shall appoint a committee of three on pharmacopœias and formularies to co-operate in the work of the Section by obtaining papers on the subjects of pharmacopœias and formularies and discussions thereon. The officers shall arrange in advance of the meeting the business to come before the Section.

ARTICLE IX. The officers of the Section on Pharmaceutical Legislation and Education shall keep a record of, and compile for reference, the enactments of the different States regulating the practice of pharmacy and the sale of medicines; shall report at each stated meeting of the Association what legislation on pharmaceutical subjects has occurred during the year; shall arrange the business of the Section in advance of its sessions, propose suitable subjects for discussion, and shall attend to such duties as may be delegated to them by the Section; shall propose each year a subject for discussion at the meetings of the State Associa-

tions, and, at the following annual meeting of this Association, shall present a report of the section of the State Associations upon the subject proposed.

ARTICLE X. The officers of the Section on Historical Pharmacy shall arrange the business of the Section and shall present annually matters of special historical interest in pharmacy; and shall also secure the collection of letters, papers, etc., written by members of the Association, which when so collected shall remain in the custody of the Section and be available for reference to any one interested.

ARTICLE XI. The Women's Section shall consist of women who are regular members in good standing in the American Pharmaceutical Association, and the women of the families of regular members in good standing, united for the purpose of promoting the aims of the American Pharmaceutical Association and for advancing the interests of women engaged in pharmaceutical pursuits.

ARTICLE XII. The order of business at the first session of each annual meeting shall be as follows:

Section 1. Promptly at the time named in the notice issued for the meeting, the President, or, in his absence, one of the Vice-Presidents, or, in their absence, a President *pro tempore*, shall officiate.

Section 2. In the absence of the General Secretary, the President shall appoint a Recording Secretary *pro tempore*, who shall perform the duties of the General Secretary until his arrival.

Section 3. Nineteen members shall constitute a quorum for the transaction of business.

Section 4. The President's Address may then be read, after which the Council shall report the list of properly accredited delegates.

Section 5. Reports of Committees shall be presented, read by their titles, synopsis, or in full, and laid on the table for future consideration.

Section 6. An abstract of the minutes of the Council shall be read at the annual meeting of the Association, and the acts of the Council shall be approved, amended or revised so as to be acceptable to the Association. At any general session, a member may request further information upon any matter reported on by the Council.

Section 7. The President shall call the roll of States, the Territories, District of Columbia, and the Provinces of Canada, requesting the members present from each State or Territory to appoint two members, the persons so selected to act as a Committee to nominate officers for the Association and members of the Council for the ensuing three years; in addition to which the President shall appoint five members from the Association-at-large to act with the Committee. Delegates who are not members must complete their membership before they are eligible to serve on the Nominating Committee.

Section 8. Incidental business.

ARTICLE XIII. The order of business at the second general session at each annual meeting shall be as follows:

Section 1. The President shall call the Association to order.

Section 2. The Secretary shall read the minutes of the preceding session, which may be amended, if necessary, and shall then be approved.

Section 3. The report of the Committee on Nominations shall be read.

Section 4. Reading of the Minutes of the Council.

Section 5. Reading of the Reports of the Treasurer and General Secretary.

Section 6. Reports of Standing Committees shall be read.

Section 7. Reports of Special Committees shall be read.

Section 8. Incidental business.

Section 9. Adjournment subject to the call of the President.

ARTICLE XIV. The order of business for the sessions of the Sections shall be determined by each Section for itself.

ARTICLE XV. No money shall be appropriated from the Treasury by any of the Sections.

ARTICLE XVI. At the last general session of the Association the newly elected officers of the Association shall take their respective places.

ARTICLE XVII. The Council may arrange for such social sessions, to be held after the adjournment of the last general session, as it may deem expedient, but no business of the Association can be transacted at these social sessions.

CHAPTER X.

Of Committees.

ARTICLE I. There shall be appointed or elected standing committees as follows: A Committee on United States Pharmacopœia, a Committee on Transportation, and a Committee on Research, each to consist of ten members; a Committee on Pharmaceutical Syllabus, to consist of seven members; a Committee on Time and Place of Meeting; a Committee on Ebert Prize, and a Committee on General Prizes, each to consist of three members; and a Committee on Program.

ARTICLE II. Any person desiring to submit a paper to the Association shall present to the Chairman of the particular Section to which it refers at least ten days prior to the meeting, an abstract of said paper, indicative of its contents, and consisting of not less than fifty nor more than two hundred words.

This abstract shall be printed as a part of the program. The paper itself must be submitted to the officers of the Section previous to the first session. Not more than ten minutes shall be allowed for the presentation of any paper, unless by unanimous consent of the Section. This does not apply to the Scientific Section, which handles its papers in accord with the by-laws of said Scientific Section.

All papers presented to the Association and its branches shall become the property of the Association, with the understanding that they are not to be published in any other publications than those of the Association, except by the consent of the Committee on Publication.

ARTICLE III. The Committee on the Ebert Prize, which shall be appointed by the Chairman of the Scientific Section, shall, at the next annual meeting after the one at which essays are presented, determine which, if any of them, has met the requirements of the founder of the prize. In all respects it shall be governed by the stipulations expressed by the donor.

ARTICLE IV. The Committee on General Prizes, which shall be appointed by the President, shall, at the next annual meeting after the one at which the papers are presented, determine which, if any of them, are worthy of prizes, and decide upon the relative merits of such papers as are deemed worthy.

ARTICLE V. The Committee on the United States Pharmacopœia shall be appointed by the President of the Association as follows: One member to be appointed for ten years and one for nine, eight, seven, six, five, four, three, two and one years, respectively, each vacancy occurring by expiration of term to be filled by a new appointment for ten years. The Committee shall elect its own Chairman annually. It shall collect statistics regarding the frequency with which official and non-official remedies are used in legitimate practice, and shall endeavor to ascertain the general wishes and requirements of the profession throughout the country in regard to any desired changes or improvements in the Pharmacopœia. It shall also note errors of any kind found in the U. S. Pharmacopœia so as to facilitate and aid the work of the National Committee of Revision of the U. S. P.

ARTICLE VI. The Committee on Transportation, which shall be elected by the Council, shall consist of one member each from the cities of Boston, New York, Chicago, St. Louis, Cincinnati, New Orleans, Atlanta, St. Paul, or Minneapolis, Denver, Baltimore, Cleveland and San Francisco, and in conjunction with the General Secretary and the Local Secretary, who shall be members of the Committee, shall arrange for transportation from the different sections of the United States and Canada to the place of meeting and return. The Council shall annually elect the Chairman of this Committee.

ARTICLE VII. The Committee on Pharmaceutical Syllabus shall be appointed by the President of the Association as follows: One member shall be appointed for seven years, and one for six, five, four, three, two and one years, respectively; each vacancy occurring from expiration of term shall be filled for a term of seven years; other vacancies shall be filled at the annual meetings of the Association for the unexpired terms. This committee shall report to the Association through the Section on Pharmaceutical Legislation and Education, shall be members of the National Committee on Pharmaceutical Syllabus and shall recommend to the Association its proportionate share of the current expenses.

ARTICLE VIII. The reports of all committees of the Association must be sent to the General Secretary in time for presentation at the first general session of the annual meeting of the Association.

ARTICLE IX. The Committee on Program shall consist of the Local Secretary, The General Secretary and the Secretary of the Council. It shall be the duty of the committee to prepare and submit to the Council the program for the annual meeting so that same can be published in the JOURNAL at least two months in advance of the annual meeting.

ARTICLE X. The Committee on Pharmaceutical Research shall be elected by the Council, two members to serve for a term of five years, two for a term of four years, two for a term of three years, two for a term of two years, two for a term of one year, and after the expiration of the one-year term two members shall be elected annually for a term of five years, the Committee on Pharmaceutical Research shall endeavor to promote research along pharmaceutical lines and shall advise the Council as to the use of the research funds of the Association.

CHAPTER XI.

House of Delegates.

ARTICLE I. There shall be and hereby is created a House of Delegates to have and to exercise such functions as may be hereafter specified by the Association.

CHAPTER XII.

Rules of Order and Debate.

ARTICLE I. The ordinary rules of parliamentary bodies shall be enforced by the presiding officer, from whose decision, however, appeals may be taken, if required by two members, and the meeting shall thereupon decide without debate.

ARTICLE II. When a question is regularly before the assembly and under discussion, no motion shall be received but to adjourn, to lay on the table, for the previous question, to postpone to a certain day, to commit or amend, to postpone indefinitely; which several motions have precedence in the order named. A motion to adjourn shall be decided without debate.

ARTICLE III. No member may speak twice on the same subject, except by permission, until every member wishing to speak has spoken.

ARTICLE IV. On the call of any two members, the ayes and nays shall be ordered, when every member shall vote, unless excused by a majority of those present, and the names and manner of voting shall be entered on the minutes.

ARTICLE V. On all points of order not covered in these By-Laws, the Association shall be governed by the established usages in all assemblies governed by parliamentary rules.

CHAPTER XIII.

Local Branches.

ARTICLE I. Local Branches of this Association may be formed whenever it may appear that fifteen members of this Association in good standing, will participate, provided that no more than one such branch shall be formed in any one state, province, district or territory unless such branches shall be formed at a point distant one hundred miles or more from any branch already established in the same state, province, district or territory.

ARTICLE II. All active or voting members of local branches must be members of this Association in good standing.

ARTICLE III. The objects and aims of local branches of this Association shall be the same as set forth in ARTICLE I of the Constitution of this body, and the acts of local branches shall in no way commit or bind this Association, and can only serve as recommendations to it. And no local branch shall enact any article of constitution or by-law to conflict with the Constitution or By-Laws of this Association.

ARTICLE IV. Each local branch having twenty-five active or voting members shall be entitled to elect one member every three years, who shall become and continue a member of the Council of this Association for that time.

CHAPTFR XIV.

Miscellaneous.

ARTICLE I. Every proposition to alter or amend these by-laws shall be submitted in writing at a general session, and may be balloted for at any subsequent general session, when, upon receiving the votes of three-fourths of the members present, it shall become a part of the by-laws.

BY-LAWS OF THE COUNCIL

(Revised to September 1, 1918, inclusive.)

CHAPTER I.

Of the Election of Officers.

ARTICLE I. The officers of the Council shall consist of a Chairman, a Vice-Chairman and a Secretary, who shall be elected by ballot by the Council, to serve one year.

ARTICLE II. They shall be elected and shall assume the duties of their respective offices after the election of new members of the Council by the Association.

CHAPTER II.

Of the Chairman and Vice-Chairman.

ARTICLE I. The Chairman shall preside at all meetings of the Council; in his absence or on account of inability from any cause, the Vice-Chairman, or, in the absence of both, a Chairman *pro tempore*, shall perform the duties of the Chairman.

ARTICLE II. The Chairman of the Council shall confer with the Chairman of the various special and standing committees of the Association, during its sessions, in order to arrange and expedite the business of the Association.

CHAPTER III.

Of the Secretary.

ARTICLE I. The Secretary shall keep fair and correct minutes of the proceedings of the meetings and carefully preserve all reports and papers of every description received by the Council. He shall receive an annual salary not to exceed \$300, and the amount of his expenses incident to the meeting, in addition to his salary.

ARTICLE II. He shall read all the papers handed him by the Chairman for that purpose; shall call and record the ayes and nays whenever they are required to be called; he shall notify the Chairman of every special committee of his appointment, giving him a list of his colleagues, and stating the business upon which the committee is to act, and shall notify every member of the time and place of each meeting of the Council.

CHAPTER IV.

Of Committee on Publication.

ARTICLE I. The Committee on Publication shall consist of five members, to be elected by ballot by the Council, together with the Editor-in-chief of the JOURNAL, the General Secretary, the Reporter on the Progress of Pharmacy and the Treasurer as *ex-officio* members. The Council shall elect the Chairman.

ARTICLE II. The Committee on Publication shall have charge of the editing, publication and distribution of the Report on the Progress of Pharmacy and the JOURNAL of the Association, and such other publications as may be issued, under rules and regulations to be approved by the Council.

ARTICLE III. The Editor-in-chief of the JOURNAL shall be elected annually, and shall receive from the Treasurer for his services such compensation as the Council may direct.

ARTICLE IV. The Editor-in-chief of the JOURNAL shall have charge of the editing, publication and distribution of the JOURNAL subject to the rules and regulations of the Committee on Publication.

ARTICLE V. In case of illness or other inability of the Editor-in-chief to carry on the work of the JOURNAL, the Committee on Publication shall be authorized to make the best arrangements possible to continue the work.

CHAPTER V.

Of Committee on Finance.

ARTICLE I. The Finance Committee shall consist of three members and shall each year, previous to January 1, present to the Council for its consideration a list of appropriations to cover the various expenditures of the ensuing fiscal year. No payment shall be made in excess of any of the said appropriations, except by a special vote of the Council. Provided, however, that the Treasurer is author-

ized to transfer from one appropriation account to another such amount as may be needed at any time, the amount of any such transfer not to exceed the sum of fifty (\$50.00) dollars.

All motions and resolutions involving the expenditure of any sum in excess of \$25.00 shall have the approval of the Finance Committee before being acted upon by the Council.

All appropriations made for any fiscal year shall lapse at the end of the said fiscal year. Provided, however, that accounts properly chargeable against any of said appropriations prior to their expiration, but not received by the General Secretary until after the end of the fiscal year, may be paid from such appropriation, in case the warrant for such payment be drawn not later than twenty days after the expiration of said fiscal year.

CHAPTER VI.

Of Committee on Centennial Fund.

ARTICLE I. A Committee on the Centennial Fund shall be formed, consisting of the President or one of the Vice-Presidents of the Association, of the Chairman of the Committee on Finance, and the General Secretary. It shall receive applications in writing from members for grants from the interest derived from the Centennial Fund, the applications to be accompanied by a statement of the investigation to be made, and of the amount and cost of material required—it being understood that the results of the investigation, together with a full report thereon, be laid before the annual meeting of the Association.

ARTICLE II. The Committee shall consider these applications, and at as early a date as possible shall report to the Council, an outline of the proposed investigations, together with such recommendations of grants from the available funds as it may deem proper.

ARTICLE III. The Council shall decide upon these recommendations, and in case the grants be approved, the Chairman of the Council shall direct orders to be drawn upon the Treasurer in favor of those members to whom grants have been made.

CHAPTER VII.

Of Sessions.

ARTICLE I. The Council shall meet previous to the assembling of the Association, and at such other times as it may determine, or at the call of the Chairman.

ARTICLE II. On the written application of three members to the Chairman of the Council, a special session shall be called.

ARTICLE III. Nine members of the Council shall constitute a quorum.

ARTICLE IV. The order of business at the first session of the Council shall be as follows:

1. Organization by the election of the Chairman, Vice-Chairman and the Secretary.

2. Election of the Standing Committees of Council, as follows:
 - a. Committee on Finance, three members.
 - b. Committee on Publication, five members.
 - c. Committee on Centennial Fund, three members.
3. Unfinished and deferred business from the last Council, or such business as is especially referred to the Council from the Association.
4. Reading the names of candidates for membership.
5. Reading of reports and appointment of committees.
6. New business.
7. Adjournment—and before the final adjournment, the minutes of the last session of the Council shall be read and approved.

CHAPTER VIII.

Miscellaneous.

ARTICLE I. Three members of any of the Standing Committees shall constitute a quorum for the transaction of business.

ARTICLE II. In all questions arising before the Council or its Committees, and which can be disposed of by a positive or negative vote, the Chairman of the Council or the Chairman of the Committee may take the vote of their respective bodies in writing, and the same shall have the same force and effect as if members had been personally present, a majority of the votes cast being considered sufficient to decide a question. The ayes and nays^d of such votes taken by the Council shall be entered upon the minutes.

ARTICLE III. Every proposition to alter or amend these By-Laws shall be submitted in writing, and may be balloted for at the next session of the Council, when, upon receiving the vote of three-fourths of the members present, it shall become a part of these By-Laws.

BY-LAWS OF THE SCIENTIFIC SECTION OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

(Revised to September 1, 1918, inclusive.)

SECTION I.

NAME.

ARTICLE I. This organization shall be known as the Scientific Section of the American Pharmaceutical Association.

SECTION II.

MEMBERSHIP.

ARTICLE I. All members of the American Pharmaceutical Association in good standing, who express a desire to do so, by registering their names with the Secretary of the Section, shall become members of the Section.

SECTION III.

OFFICERS.

ARTICLE I. The officers of the Section shall be a Chairman, a First Vice-Chairman, a Second Vice-Chairman and a Secretary, selected from members of the Section.

SECTION IV.

ELECTION OF OFFICERS.

ARTICLE I. The Chairman of the Section shall at the first session appoint a committee of three, who shall report to the Section at the same session two names for each office. At the last session of the Section these names shall be balloted upon, and the one receiving a majority for that particular office shall be declared elected. These shall then be installed and shall hold office for one year or until their successors are duly elected.

ARTICLE II. Officers may be re-elected, but with the exception of the Secretary shall not hold the same office for more than two consecutive years.

ARTICLE III. The Council of the Association shall fill any vacancies that may occur among the officers.

SECTION V.

DUTIES OF OFFICERS.

Chairman and Vice-Chairman.

ARTICLE I. It shall be the duty of the Chairman to represent the Section in the Council of the Association, to preside at the annual meetings of the Section, appoint all committees of the Section and fill any vacancies when occurring in these committees. He may present an annual address on any subject of interest to the Section that he may deem of sufficient importance.

ARTICLE II. In the absence of the Chairman, the First Vice-Chairman shall preside and exercise all the functions of the Chairman.

ARTICLE III. In the absence of the Chairman and the First Vice-Chairman the second Vice-Chairman shall preside and exercise all the functions of the Chairman.

ARTICLE IV. In the absence of all three of these officers the Section shall elect a temporary Chairman.

Secretary.

ARTICLE V. The Secretary shall keep a record of the proceedings of the Section, shall send to the members such notice as the business of the Section may require, shall transmit to the General Secretary the names of the officers and committees elected or appointed, and notify the General Secretary of any changes in the personnel of the officers or committees of the Section, and shall furnish the General Secretary a report of the sessions held at the annual meeting. The Secretary, at least two months in advance, shall write to each member of this Section, giving notice of the latest date upon which papers can be accepted for the program.

ARTICLE VI. The Secretary shall be custodian of the records and documents of the Section, as well as of all funds, and shall make all disbursements subject to the approval of the Chairman.

ARTICLE VII. The Secretary shall arrange the program for the annual meeting, and furnish the editor of the JOURNAL of the Association the program for inclusion in the number just preceding the annual meeting.

ARTICLE VIII. The Secretary shall at each annual meeting present a brief report to the Association of the condition within the Section.

ARTICLE IX. In case the Secretary is unable to attend the annual meeting, he shall notify the Council to that effect and the Council shall then appoint a temporary Secretary.

SECTION VI.

MEETINGS.

ARTICLE I. At least three sessions of the Section shall be held at each annual meeting of the Association. Additional sessions may be held at any time during the meeting when the officers of the Section may see fit, and by consent of the Council; provided, however, that these sessions be so arranged that they conflict as little as possible with sessions of other Sections, and that no session be held simultaneously with the final session of the Association.

SECTION VII.

ORDER OF BUSINESS.

ARTICLE I. The order of business at the first session shall be as follows: (1) Chairman's Address; (2) Secretary's Report; (3) Report of Standing Committees and Committees of the Association which report to this Section; (4) Nomination of Officers; (5) Miscellaneous Business; (6) Reading of Papers.

ARTICLE II. The time of the other sessions shall be taken up with the reading of papers, excepting as provided for in Section IV (Election of Officers), and Section X (Amendments), or to hear the reports of special committees.

ARTICLE III. Provided, however, that discussion of papers may be interrupted at any time to consider matters referred to the Section by the Association in general session or by the Council.

ARTICLE IV. This regular order of business may be suspended at any time during a session, for that particular session, by a three-fourth vote of those present.

SECTION VIII.

EXPENSES.

ARTICLE I. The expense of printing, postage and stationery shall be paid from the Association treasury, but in no case to exceed \$25.00 for one year.

ARTICLE II. Appropriations for expenses other than those named here must be procured by authority of Council through the Chairman of the Section.

SECTION IX.

PAPERS.

ARTICLE I. Original papers on any subject of scientific interest may be accepted at the discretion of the officers of the Section.

ARTICLE II. The complete title and a brief extract of all papers, not to exceed 250 words, must be in the hands of the Secretary in time for inclusion in the program which is published, as provided in Section V, Article 7.

ARTICLE III. Fifteen minutes shall be allowed for the reading of a paper. If the paper is too lengthy to be read in detail within this space of time, it shall be presented in abstract.

ARTICLE IV. Each speaker in the discussion of a paper shall be allowed five minutes, but all such discussion shall be confined to the paper or subject under consideration at that time.

ARTICLE V. The time allowed for presenting a paper or discussion may be extended by unanimous consent of those present.

ARTICLE VI. All papers and reports presented to the Section become the property of the Association and shall be forwarded to the Editor of the JOURNAL immediately following the annual meeting by the Secretary of the Section.

SECTION X.

AMENDMENTS.

ARTICLE I. These by-laws may be amended at the final session of any annual meeting by a two-third vote of those present, provided notice of such amendment is given together with the text thereof at any previous session held at that meeting. Amendments must finally be accepted by the Council as not in conflict with the Constitution and By-Laws of the Association.

SECTION XI.

MISCELLANEOUS.

ARTICLE I. Questions not specifically covered by these by-laws shall always be decided in accord with the Constitution and By-Laws of the Association.

BY-LAWS OF THE HOUSE OF DELEGATES OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

(Revised to September 1, 1918, inclusive.)

CHAPTER I.

ARTICLE I. Functions. The House of Delegates shall have and exercise the following functions:

A. To receive and consider the reports of delegates from the bodies which they represent in the House of Delegates and to receive the greetings of fraternal delegates to the Association from other organizations or from departments of the United States Government.

B. Consider and report upon such resolutions and upon such other subjects as may be referred to the House of Delegates by the Council or by the Association in general session, or by the various Sections.

C. Make a final report of the business transacted by the House of Delegates to the Association not later than the last general session at each annual meeting.

D. It shall have the authority to adopt all rules and regulations necessary for the proper conduct of its business and not inconsistent with the Constitution and By-Laws of the Association and the Council.

CHAPTER II.

ARTICLE I. Representation. The membership of the House of Delegates shall consist of three regularly appointed delegates from each state pharmaceutical association, from the District of Columbia Association, and from similar associations in Porto Rico, the Philippines and any other foreign American state, provided, however, that the delegates so appointed will have the privilege of the floor, but not vote, unless they be members of the American Pharmaceutical Association.

Delegates from all other bodies or organizations shall have the privilege of the floor but shall not have the right to vote.

ARTICLE II. Term of Service. The elected or appointed delegates shall hold office for one year, or until the credentials of their successors shall have been approved by the Council.

CHAPTER III.

ARTICLE I. Organization. The first session of the House of Delegates at each annual meeting shall be called to order by the Chairman, or one of the Vice-Chairmen, or the Recording Secretary of the preceding House; or, in the absence of all of these, by the General Secretary of the Association.

ARTICLE II. Voting. Each delegate shall be entitled to one vote. No delegate shall act as proxy of another delegate who has not been seated, nor as delegate for more than one association, organization, or institution.

ARTICLE III. Privileges. Any member of the American Pharmaceutical Association may attend any session of the House of Delegates and shall have the privilege of the floor.

CHAPTER IV.

ARTICLE I. Officers. The officers of the House of Delegates shall consist of a Chairman, two Vice-Chairmen and a Recording Secretary, who shall be elected annually by ballot by the House of Delegates.

ARTICLE II. Duties of Chairman and Vice-Chairman. The Chairman shall preside at all meetings of the House of Delegates; in his absence, or on account of inability from any cause, the First Vice-Chairman; or, in his absence, the

Second Vice-Chairman; or in the absence of the three, a Chairman *pro tempore* shall perform the duties of the Chairman.

ARTICLE III. Duties of the Recording Secretary. The Recording Secretary shall keep fair and correct minutes of the proceedings of the meetings and carefully preserve all reports and papers of every description received by the House of Delegates, and deliver the same to the General Secretary of the Association at the annual meeting. The Recording Secretary shall read all papers received for the purpose; shall call and record the ayes and nays whenever they are required to be called; shall notify the Chairman of every special committee of his appointment, giving a list of his colleagues, and stating the business on which the committee is to act, and shall give notice of the time and place of each meeting of the House of Delegates.

ARTICLE IV. The General Secretary of the Association shall, in January of each year, send appropriate blank credentials for delegates to the various bodies entitled to representation in the House of Delegates, notify the said associations of the time when the credentials, properly filled out, shall be returned, and on or preceding the first day of the annual convention shall deliver such credentials to the Recording Secretary. All credentials received after the opening of the convention shall be handed directly to the Recording Secretary.

The General Secretary shall cause all of the proceedings of the House of Delegates annually to be printed in the JOURNAL of the Association, and shall procure a sufficient number of reprints of the same for distribution among the members of the House of Delegates and the officers of the Association. Said reprints shall also contain the by-laws and a list of the members, officers and committees of the House of Delegates.

CHAPTER V. .

ARTICLE I. Sessions. The House of Delegates shall hold at least one session during the annual meeting of the Association at an hour previously determined by the Executive Committee and such additional sessions as may be necessary for the transaction of its business.

CHAPTER VI.

ARTICLE I. The Committee on Resolutions. The Chairman shall appoint a Committee on Resolutions consisting of five members, to which shall be referred all resolutions, and which shall report to the House the results of its deliberation not later than the last session of the House.

ARTICLE II. The Chairman, Vice-Chairmen and Recording Secretary shall constitute an Executive Committee to pass upon the credentials of representatives to the House of Delegates, to arrange the program for the annual meeting, and to perform such other duties as are commonly discharged by executive committees, or which may be referred to them by the Association or by the House of Delegates.

ARTICLE III. Special Committees. The Chairman shall appoint such special committees as may be directed by the House.

CHAPTER VII.

ARTICLE I. Resolutions. All resolutions shall receive a majority of affirmative votes of those present for adoption.

ARTICLE II. Amendments. Every proposition to amend these by-laws shall be submitted in writing at one session of the House and may be balloted upon at the next session, when upon receiving the affirmative vote of three-fourths of the members present it shall become a part of the by-laws.

CHAPTER VIII.

ORDER OF BUSINESS.

The following shall be the Order of Business:

1. Calling Roll of Delegates whose credentials have been approved by the Executive Committee.
2. Appointment of Committee on Resolutions.
3. Reading of communications from the Association, Sections and Council.
4. Calling Roll of Delegations for reports, resolutions and communications, all of which shall be in writing.
5. Miscellaneous business.
6. Election and Installation of Officers.
7. Adjournment to a certain time.

GENERAL RULES OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

(Revised to September 1, 1918, inclusive.)

Rule 1. Advertisements for Publications: At the forty-seventh annual meeting (1889), the Council resolved that no advertisements be solicited or accepted for any of the publications or programs issued by or in the name of the Association, and the General Secretary was instructed to inform annually the Local Secretary and pharmaceutical press of the resolution.

Rule 2. Term of Council Members from Local Branches: At the 55th annual meeting (1907), it was ordered that the three-year term of members of the Council elected by Local Branches of the A. Ph. A. shall date from the last annual meeting of the Association held previous to the date of election of the new Council members by a Local Branch.

Rule 3. Proceedings of National Association of Boards of Pharmacy and American Conference of Pharmaceutical Faculties in A. PH. A. JOURNAL: That space be annually set aside in the JOURNAL of the American Pharmaceutical Association for abstracts of the Proceedings of the meetings of the National Association of Boards of Pharmacy and the American Conference of Pharmaceutical Faculties.

Rule 4. Salary Year of Officers: At the fifty-seventh annual meeting (1909), it was ordered that the salary year of the officers of the American Pharmaceutical Association be changed so as to run from July of one year to July of the next year, instead of, as heretofore, from September to September.

Rule 5. Names of Life Members: At the fifty-seventh annual meeting (1909), it was ordered that the names of life members, new style, be designated in the published Roll and List of Members by means of heavy-faced or black-faced type.

Rule 6. Approval of Application for Membership: At the fifty-eighth annual meeting (1910), it was ordered that the Committee on Membership submit all names of applicants for membership to the respective State representative on the committee for approval before sending the application to the Secretary of the Committee on Membership for submission to the vote of the Council, or if they be sent direct to the Secretary of the Committee on Membership, they shall be sent by him first to the State representative for approval. The Secretary of the Committee on Membership shall have discretionary power in the application of this rule.

Rule 7. Resignation of Members: At the fifty-eighth annual meeting (1910), it was ordered that the resignation of a member may be accepted during the first six months of the fiscal year for which his annual dues are payable.

Rule 8. Address of Welcome at Opening General Session: Address of welcome and responses thereto at the opening general session shall be omitted.

Rule 9. Meetings of Council: The meetings of the Council shall be held in the evenings with the exception of the first and the last sessions.

Rule 10. Time of Section Meetings: The work of the various Sections shall start promptly in the morning at 9.30 o'clock, lasting until 12 o'clock, and in the afternoon at 2 o'clock, lasting until 5 or 6 o'clock.

Rule 11. Section and Association Meetings: The Section and Association meetings shall be confined to mornings and afternoons.

Rule 12. Concurrent Meetings of Sections: The principle of concurrent meetings of the Sections shall be established. There shall be used a series of bulletins in the section rooms notifying members what papers are being read and discussed in the different several Sections.

Rule 13. Manuscripts for Section Meetings: The chairmen of the Sections shall use every endeavor to secure all manuscripts within four weeks of the annual meeting, and shall immediately send them to the General Secretary.

Rule 14. Printing of Accepted Manuscripts: The General Secretary shall have accepted manuscripts printed in advance of the annual meeting, whenever in the judgment of the Chairman of the Section and the General Secretary it is desirable.

Rule 15. Collective Program of Sections: With all manuscripts in hand three or four weeks before the annual meeting, the General Secretary shall prepare a collective program containing the detailed programs of the different Sections and indicating at what particular session any given paper shall come up for reading and discussion.

Rule 16. Editor as Historian: The Editor-in-chief of the JOURNAL shall be *ex-officio* Historian of the Association.

GENERAL RULES OF FINANCE OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

(Revised to September 1, 1918, inclusive.)

Rule 1. Deposits of Moneys of Funds: The Treasurer shall deposit all moneys received by him, except those belonging to the various "Funds," with some reliable banking company, where said money may be drawing interest for the benefit of the Association, said banking company to be designated by the Finance Committee and approved by the Council.

Rule 2. Payments of Moneys of Funds: Said moneys shall be deposited in the name of the American Pharmaceutical Association, and shall be paid out by numbered checks drawn by the Treasurer, on written warrant signed by the General Secretary.

Rule 3. Payment of Bills: The correctness of every bill shall be certified to by the person contracting the same and the General Secretary, and the latter shall note on the bill the appropriation against which the same is to be charged. The bill shall then be submitted to the Chairman of the Committee on Finance for approval, before payment is made. A warrant shall then be drawn and signed by the General Secretary, upon receipt of which, together with the original bill and voucher, the Treasurer shall draw a check for the amount.

Rule 4. Deposits in Banks: The Treasurer shall make a daily deposit in bank whenever his receipts amount to \$100 or more.

Rule 5. Custodian of Funds: The Treasurer shall be the custodian of the bonds and saving-bank books, representing the several Funds belonging to the Association; and bonds and bank-books shall be in the name of the Treasurer, and the accounts of the same shall be kept by him.

Rule 6. Appointment of Auditing Committee: There shall be annually appointed by the Council an Auditing Committee, this Committee to consist of three members residing in or near the same city or town as that in which the Treasurer resides, the Chairman to be named by the Chairman of the Council.

Rule 7. Annual Report of Treasurer, General Secretary and Editor: The Treasurer, General Secretary and Editor shall balance their books on January 1st of each year and shall make out previous to the fifteenth day of February following, their annual reports for the financial year just closed.

Rule 8. Auditing of Accounts of Treasurer, General Secretary and Editor: The Treasurer, General Secretary and Editor having thus balanced their books and made out their reports, shall place all such books, accounts, vouchers, etc., with the reports, at the disposal of the Chairman of the Auditing Committee at such time and place in February of each year as the said Chairman may direct.

Rule 9. Return of Books to Treasurer, General Secretary and Editor: Said books, accounts, vouchers, saving-bank books and accounts of the same shall be returned to the Treasurer, General Secretary and Editor, respectively, within two weeks of the date of their reception by the Chairman of the Auditing Committee.

Rule 10. Meeting of Auditing Committee: There shall be a meeting of the Auditing Committee in February of each year, and it shall be the duty of said Committee, at such meeting, to carefully examine all the books, accounts, vouchers, funds, etc., received by them; and previous to the first day of March following, to make a report thereon, in writing, to the Chairman of the Council.

Rule 11. Expense of Bonds of Treasurer and General Secretary: The expense of the bonds of the Treasurer and General Secretary given by a Trust Company, shall be paid for from the Treasury.

Rule 12. Merging of Balances: All balances remaining from appropriations at the close of each fiscal year shall be turned back into the treasury, unless otherwise ordered by the Council.

Rule 13. Committee on Invested Savings and Trust Funds: The Chairman of the Council is instructed to appoint three members of the Association who, together with the Treasurer, shall be known as the Committee on Invested, Savings and Trust Funds.

Of the three members first appointed, one shall be appointed for one year, one for two years and one for three years. Each year thereafter, one member shall be appointed for three years. Members of the committee need not be members of the Council.

It shall be the duty of said committee to carefully consider the nature and status of all invested, savings and trust funds of the Association, and to make an annual written report upon the same to the Council, which report shall be read (in full) at one of the general sessions of the annual convention of the Association, and published (in full) in the annual volume of Proceedings thereof.

The present custody of the funds shall not be affected by the adoption of these resolutions, neither shall the committee have the power to invest or re-invest any of such funds, except as instructed by the Council or Association.

Rule 14. Disposal of Receipts from the National Formulary: The Treasurer shall keep a separate and accurate account of all receipts of and disbursements for the National Formulary. Any balance of receipts in excess of disbursements, remaining at the end of any fiscal year, after making due allowance for any outstanding indebtedness on behalf of the National Formulary, shall be credited as follows: Fifty per cent. to the general funds of the Association as partial repayment for that portion of the overhead charges of the Association incurred on behalf of the National Formulary; and the remaining fifty per cent. to the credit of the American Pharmaceutical Association Research Fund. This fund is to be held as a permanent fund by the American Pharmaceutical Association through its Council or controlling body.

Until such time as the American Pharmaceutical Association Research Fund has accumulated from this source or from bequests, contributions, etc., a fund of not less than one hundred thousand (\$100,000.00) dollars, the Council may expend not more than fifty per cent. of the net income of said Fund. When this Research Fund shall exceed one hundred thousand (\$100,000.00) dollars, then the Council may expend annually a sum not exceeding the income derived from the investments held by the said Research Fund.

From the funds thus available, the Council may grant such honorariums or awards to encourage investigation and research upon any subject relating in

any way to pharmacy or to the collateral sciences as may in their judgment be deemed proper. In the granting of such honorariums or awards, preference shall be given to such applications or subjects as are recommended by the committees of Revision of the United States Pharmacopœia or the National Formulary.

Rule 15. Depository of the American Pharmaceutical Association Research Fund: That the selection of the depository and all investments of the funds of the American Pharmaceutical Association Research Fund shall be made by the Treasurer and the Committee on Finance.

Rule 16. Designation of Safe Deposit Vaults for Funds and Securities: That the Committee on Invested and Trust Funds shall annually recommend to the Council the banks and safe deposit vaults in which the funds and securities, respectively, of the Association shall be kept for the ensuing year.

GENERAL RULES OF PUBLICATION

(Revised to September 1, 1918, inclusive.)

1. Approval and Payment of Bills of JOURNAL: All bills on account of the JOURNAL shall be certified to by the Editor and sent as soon as possible to the Chairman of the Committee on Publication for approval and then sent by the latter to the General Secretary for payment in accordance with Article II, Chapter V, of the by-laws and Rule 3, of the General Rules of Finance except bills for postage, stationery, drayage, freight, expressage, miscellaneous and clerical expenses of the office of the JOURNAL (Petty and Clerical Expenses, JOURNAL Office), which shall be paid as provided for in Rule 2 of these rules.

2. Bills for Petty and Clerical Expenses, JOURNAL Office: Bills for postage, stationery, drayage, freight, expressage, miscellaneous and clerical expenses of the Office of the JOURNAL (Petty and Clerical Expenses, JOURNAL Office) shall be paid by check by the Editor of the JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION out of a deposit of \$300 to be made to the credit of the Editor of the JOURNAL OF THE AMERICAN PHARMACEUTICAL ASSOCIATION in a bank to be approved by the Committee on Publication. The Editor shall be bonded for \$500 at the expense of the Association.

The procedure for the payment of such bills shall be as follows: (1) at the end of each month, the Editor shall send all paid-and-receipted bills and cancelled checks, with an itemized bill or statement, to the Chairman of the Committee on Publication for approval; (2) after approval, the Chairman of the Committee on Publication shall send the bills and checks to the General Secretary for payment in accordance with Article II, Chapter V, of the by-laws and Rule 3 of the General Rules of Finance; and (3) the Treasurer shall send the Editor a check to cover the amount of the bills and thus increase the bank balance.

3. Bills for Year Book, National Formulary and Publications: All bills on account of the Year Book, National Formulary and other publications of the Association shall be certified to by the person contracting the same and approved by the Chairman of the Committee on Publication and sent by the latter to the General Secretary before payment in accordance with Article II, Chapter V, of the by-laws, and Rule 3 of the General Rules of Finance.

THE FUNDS OF THE AMERICAN PHARMACEUTICAL ASSOCIATION

(Revised to January 1, 1919.)

At the San Francisco meeting in 1889, the Permanent Secretary was directed to publish annually, in the Proceedings, a brief history of the origin, money value, and use to which each Fund may be applied.

There are six Permanent Funds, a General Fund, and three Trust Funds at the present time.

The Permanent Funds are (1) Life Membership; (2) Ebert Prize; (3) Centennial; (4) Endowment; (5) Ebert Legacy; (6) American Pharmaceutical Association Research Fund.

THE A. PH. A. LIFE MEMBERSHIP FUND.

The Constitution, as originally adopted in 1852, and up to the year 1856, contained no provision for life membership or for the creation of a permanent fund. In the year named a revised Constitution was reported by a committee, and after consideration, adopted (see Proceedings, 1856, pp. 12, 14, 27 and 79), Article II, Section 7 (afterwards Section 8), containing the following provision:

"Members who have paid their annual contribution for ten successive years shall be considered life members and exempt from their yearly payments, and entitled to a certificate to that effect."

Owing to increased expenditures for the publication of the Proceedings, etc., the Association found it necessary in 1867 (Proceedings, p. 75) to increase its revenue, one of the measures being the erasing of Section 8, and the total abandonment of life membership in the future.

In 1870 a revised Constitution was adopted (see Proceedings, 1870, pp. 87-96) and this, with a few slight amendments adopted in 1896 and 1900, read as follows:

"Article IV. All moneys received from life membership, together with such funds as may be bequeathed, or otherwise donated to the Association, shall be invested by the Treasurer in United States Government or State securities, the interest of which for any current year only may be used by the Association for its expenses."

In 1913 this article was amended to read as follows and is now in force:

"Article IV. All moneys received from life membership, together with such funds as may be bequeathed, or otherwise donated to the Association, may be invested by the Treasurer in United States Government, State, Municipal, County or other securities acceptable as security for postal savings deposits, the interest of which for any current year only may be used by the Association for its expenses."

Chapter VI, Article 5, of the By-Laws adopted the same year, reads as follows: "Any member who shall pay to the Treasurer the sum of *seventy-five dollars at a time* shall become a life member, and shall be exempt from all future annual contributions."

This article was amended in 1888 and 1896 and again in 1906 and changed to Article IV, Chapter VIII. As now in force, it reads as follows:

"Any member of the Association who shall pay to the Treasurer the sum of \$100.00 during the first year of his connection therewith, and also any member not in arrears, who after ten years shall pay the sum of \$75.00, or after fifteen years the sum of \$50.00, or after twenty years the sum of \$40.00, or after twenty-five years the sum of \$25.00, and any member who may have paid annual dues for thirty-seven consecutive years, shall become a life member, and shall be exempt from all future annual contributions."

In the roll of members for the year 1872 (p. 338) the name of the late Charles W. Badger, of Newark, N. J., appears for the first time as a life member, and the only one (until the time of his death in 1877) under this provision, which was subsequently modified (Proceedings, 1879, p. 799) so as to reduce the sum to be paid into the treasury by those who had been members for from five to twenty years. In the same year the published roll contained the names of two new life members. The article on life membership was further modified in 1888 (Proceedings, p. 52), again 1896 (Proceedings, p. 17), and again in 1906 (Proceedings, p. 100), so as to apply to those who have been members for over twenty years (see Chapter VIII, Article IV, of the By-Laws). Under this clause the life membership (new style) of the present roll is one hundred and sixteen.

The Treasurer's report for 1880 (p. 524) states the life membership fund to be \$75, for 1881 (p. 513) \$613, for 1882 (p. 608) \$685, for 1883 (p. 436) \$904.38, and for 1884 (p. 524) \$944.14. At the Milwaukee meeting, held in the same year, the Association directed (Proceedings, p. 525) that \$316, which amount had been in past years donated to the funds of the Association by various members, be withdrawn from the general fund to be added to the Life Membership Fund. At the Providence meeting in 1886 (Proceedings, p. 147) it was recommended by the Finance Committee, and approved by the Council and by the Association, that the sum of \$3,000 be transferred from the general fund to the Life Membership Fund. At the Cincinnati meeting in 1887 (Proceedings, p. 471) the Association ordered again a transfer to the same fund of \$4,000.

From 1887 to 1909 the annual reports of the Chairman of the Council give the number of each bond of the registered securities in which the Life Membership Fund is invested. Since 1910 the Treasurer has made this report. By vote of the Association, the name of this fund was changed to the William Procter, Jr., Fund on September 15, 1902 (see Proceedings, 1902, p. 214), but was changed back to its original name, Life Membership Fund, on September 5, 1906 (see Proceedings, 1906, p. 100). The report of the Treasurer of the Association shows that on January 1, 1919, the value of the Life Membership Fund was \$23,777.44 (face values of securities only given), of which sum the interest for any current year only may be used by the Association for its expenses. Massachusetts State Bonds to the amount of \$13,000 and \$10,000 of Liberty Bonds are in this fund.

THE EBERT PRIZE FUND.

At the Richmond meeting in 1873 (Proceedings, p. 58), Mr. Albert E. Ebert presented to the Association the sum of five hundred dollars to be used in the following manner:

"The money to be properly invested by order of the Executive Committee, and the annual interest derived therefrom to be appropriated for *conferring a suitable prize* for the best essay or written contribution containing AN ORIGINAL INVESTIGATION OF A MEDICINAL SUBSTANCE, determining new properties, or containing

other meritorious contributions to knowledge; or for IMPROVED METHODS of determining merit, for the preparation of chemical or pharmacal products; the prize to be awarded by a suitable committee within six months after the annual meeting at which the essays are presented for competition; provided, that in case no one of the essays offered is of sufficient merit to justify the award, in the judgment of the Committee on Prize Essays, all may be rejected, and the sum added to that of the Fund."

The offer was accepted by the Association, and by a special vote (*Ibid.*, p. 70) the fund was ordered to be called the *Ebert Fund*, and the prize awarded from the proceeds to be known as the *Ebert Prize*.

The Ebert Prize was awarded for the year 1874 to Charles L. Mitchell; for 1877, to Fred B. Power; for 1882, to John U. Lloyd; for 1886, to Emlen Painter; for 1887, to Edward Kremers; for 1888, to Jos. F. Geisler; for 1890, to Wm. T. Wenzell; for 1891, to John U. Lloyd; for 1897, to Albert B. Prescott and Jas. W. T. Knox; for 1898, to Virgil Coblentz; for 1899, to Henry Kraemer; for 1900, to Edward Kremers and Oswald Schreiner; for 1902, to J. O. Schlotterbeck and H. C. Watkins; for 1903, to Fred B. Power; for 1905, to Dr. Ernest Schmidt, of Germany; for 1906, to J. O. Schlotterbeck and H. C. Watkins; for 1907, to Fred B. Power and Frank Tutin; for 1908, to A. B. Stevens and L. E. Warren; for 1909, to Henry Kraemer; for 1910, to Harry M. Gordin; for 1911, to W. A. Puckner and L. E. Warren; for 1915, to E. N. Gathercoal; for 1916, to John Uri Lloyd.

The Ebert Fund amounted in 1883 (Proceedings, p. 436) to \$683.43. From 1887 to 1909 the reports of the Chairman of the Council specify the securities in which this fund is invested. Since 1910 the report has been made by the Treasurer. The annual interest must be applied to a prize for an original investigation meeting the requirements stated above.

In accordance with the recommendation of the committee on invested savings and trust funds, submitted and adopted at the fifty-eighth annual meeting (see Proceedings, 1910, p. 454) the name of the Ebert Fund was changed to Ebert Prize Fund, and the amount of the prize limited to \$25.00 until the excess of interest above the sum annually awarded and added to the principal shall amount to \$1,000.00, after which the entire annual interest upon the same shall constitute the Ebert Prize. On January 1, 1919, the Fund was \$1,181.94.

THE A. PH. A. CENTENNIAL FUND.

After the meeting held in Philadelphia in 1876, the local committees, on settling all accounts for the entertainment of the Association, had an unexpended balance left which by subsequent collections made in Philadelphia was increased to \$525. At the Toronto meeting in 1877 (Proceedings, p. 481), Dr. A. W. Miller, local secretary for 1876, presented this sum in the name of the local committees to the Association, with this condition, "that a like amount be subscribed by the members within one year," with a view of establishing a fund to *aid in the prosecution of original investigations*, the interest accruing from the investment of the fund to be devoted to the defraying of expenses actually incurred by members in conducting investigations in some branch of science connected with pharmacy. The Association accepted the conditions (*Ibid.*, pp. 526-528), and adopted the name *Centennial Fund*.

The collection of a like amount by the Association was completed at the Saratoga meeting (Proceedings, 1880, p. 553) when \$582.81 had thus been received.

In the following year a committee of the Centennial Fund was provided for in the By-Laws of the Council, Chapter VII (Proceedings, 1881, pp. 190, 549). Members have not availed themselves of this fund to the extent contemplated at its foundation; for the amounts paid out have been only \$7.50 to Robt. B. Warder for material used for investigations reported in 1885; \$96.80 used by the Committee on National Formulary during the years 1886 and 1887 (Proceedings, 1889, p. 16); and \$32 to Edward Kremers for material necessary for the prosecution of scientific research on the menthol group, reported in the Proceedings for 1892; \$50 to the same investigator in 1893, and \$50 again to the same investigator in 1894. In 1896 the sum of \$22.33 was paid to the Committee on Indicators for material used in their investigations. In 1915 the sum of \$100 was paid Edward Kremers for research work on cultivation of medicinal plants.

The original sum of \$1107.81 (\$525 + \$582.81) had increased in 1883 to \$1232.76. From 1887 to 1909 the securities in which the fund is invested are specified in the reports of the Chairman of the Council. Since 1910 the reports have been made by the Treasurer. The interest accruing from this Fund is to be used for defraying the expenses incurred in conducting original investigations in pharmacy or an allied science. The value was \$3,176.67 (face value of securities only given) on January 1, 1919. The Fund has \$1,000 Massachusetts State Bond, \$2,000 Liberty Bonds.

THE A. PH. A. ENDOWMENT FUND.

At the fifty-fourth annual meeting held at Indianapolis, Ind., September, 1906, Messrs. Samuel A. D. Sheppard and James H. Beal proposed the establishment of a permanent fund to be known as the "Endowment Fund" (see Proceedings, 1906, p. 99) under the following conditions:

"That the said S. A. D. Sheppard and James H. Beal jointly agree to pay into said fund one dollar for each twenty dollars contributed and paid into said fund by all other members of this Association up to and until such Endowment Fund shall, with its accumulations of interest, reach the sum of twenty-five thousand (\$25,000) dollars.

"That as money shall be received as additions to said fund the same shall be invested in such securities as the Council may direct until the interest and other accumulations, together with the amount of the principal, shall reach the sum of twenty-five thousand (\$25,000) dollars.

"That when the Endowment Fund shall have reached the sum of twenty-five thousand (\$25,000) dollars one-half the income derived therefrom may be used for any purpose deemed wise by the Association.

"That when said Endowment Fund, inclusive of donations, interest and other accumulations, shall amount to the sum of fifty thousand (\$50,000) dollars, the Association may use ninety per cent. of the income therefrom for any purpose deemed wise by the Association.

"That under no circumstances whatever shall all the income from said fund be used, but at least ten per cent. thereof shall be annually added to the principal of the Endowment Fund.

"That under no circumstances whatever shall the principal or any part thereof be used for any purpose except investment for income, nor pledged for any debt or obligation of the Association, or any person, nor used for any other purpose or in any other manner than as specified."

Contributions to the Endowment Fund have been made at different times, and the names of the contributors published in the annual volume of Proceedings (see Proc., 1907, pp. 47 and 48; Proc., 1908, pp. 476 and 477; Proc., 1909, p. 464; Proc., 1910, p. 478). According to the Treasurer's report, the total amount contributed and interest accumulations up to January 1, 1919, was \$7428.12. The Fund has \$7,000 in Liberty Bonds.

THE EBERT LEGACY FUND.

The late Albert E. Ebert having by his will designated the A. Ph. A. as residuary legatee of his estate, it was ordered at the fifty-eighth annual meeting on recommendation of the Committee on Invested Savings and Trust Funds, that the money received from the estate be converted into a fund to be known as the Ebert Legacy Fund, and that this fund be invested in municipal or other public bonds approved by the Committee on Invested Savings and Trust Funds and the Finance Committee, and that this fund be kept intact and the income added thereto until the fund and its accumulations shall together amount to a total of \$10,000.00.

When this sum has been reached, the income derived from the fund shall be devoted to such purposes as will in the opinion of the Council best commemorate the founder of the fund and his services to pharmacy.

The reason for the suggestion that the Ebert Fund and the Ebert Legacy Fund be kept separate was, that the first was given by Mr. Ebert for a specific purpose, while the latter was given to the Association practically without restriction and with the evident intention that the Association should use it in the manner which it deemed best.

On December 14, 1909, the executors of the Ebert estate paid over to the Treasurer of the A. Ph. A. the sum of \$2,800.00, which has been deposited in the International Bank of St. Louis at interest. The Treasurer's report states that January 1, 1919, this fund amounted to \$4,504.64. The Fund has \$2,000 in St. Louis City Bonds and \$2,000 in Liberty Bonds.

AMERICAN PHARMACEUTICAL ASSOCIATION RESEARCH FUND.

The Association at the 1915 meeting took the first action resulting in this fund. It was then decided to make the net balance each year in the National Formulary account a part of the Endowment Fund (see JOURNAL A. PH. A., November, 1915, p. 1376). The following rule was adopted:

"Rule 14. Disposition of Receipts from National Formulary: The Treasurer shall keep a separate and accurate account of all receipts and disbursements for the National Formulary. Any balance of receipts in excess of disbursements remaining at the end of any fiscal year shall be credited to the Endowment Fund and become a part thereof."

The Committee on Publication at the 1916 meeting recommended the modification of Rule 14, and the establishment of a National Formulary Revision and Research Fund (see JOURNAL A. PH. A., October, 1916, pp. 1142 and 1144, and November, 1916, p. 1280). This resulted in the appointment of a committee to report at the 1917 meeting. Under these conditions no money was paid into the Endowment Fund under Rule 14.

The net amount to the credit of the National Formulary IV during the year 1916 was \$13,903.67 (see JOURNAL A. PH. A., August, 1917, p. 749).

At the 1917 meeting the association changed Rule 14 to read as follows (see JOURNAL A. PH. A., December, 1917, p. 1100):

"Rule 14. Disposal of Receipts from the National Formulary: The Treasurer shall keep a separate and accurate account of all receipts of and disbursements for the National Formulary. Any balance of receipts in excess of disbursements, remaining at the end of any fiscal year, after making due allowance for any outstanding indebtedness on behalf of the National Formulary, shall be credited as follows: Fifty per cent. to the general funds of the Association as partial repayment for that portion of the overhead charges of the Association incurred on behalf of the National Formulary; and the remaining fifty per cent. to the credit of the American Pharmaceutical Association Research Fund. This fund is to be held as a permanent fund by the American Pharmaceutical Association through its Council or controlling body.

"Until such time as the American Pharmaceutical Association Research Fund has accumulated from this source or from bequests, contributions, etc., a fund of not less than one hundred thousand (\$100,000.00) dollars, the Council may expend not more than fifty per cent. of the net income of said Fund. When this Research Fund shall exceed one hundred thousand (\$100,000.00) dollars, then the Council may expend annually a sum not exceeding the income derived from the investments held by the said Research Fund.

"From the funds thus available, the Council may grant such honoraria or awards to encourage investigation and research upon any subject relating in any way to pharmacy or to the collateral sciences as may in their judgment be deemed proper. In the granting of such honoraria or awards, preference shall be given to such applications or subjects as are recommended by the committees of Revisions of the United States Pharmacopœia or of the National Formulary."

In accordance with instructions of the association (see JOURNAL A. PH. A., December, 1917, p. 1100) the treasurer transferred 50 per cent. of the National Formulary Research Fund to the American Pharmaceutical Association Research Fund and 50 per cent. to the general funds of the association. This with the interest gave the A. Ph. A. Research Fund \$7,043.31. To this has been added \$4,059.24 from the National Formulary IV account for 1917 making a total of \$11,102.55 on January 1, 1918. The interest increased this to \$11,398.33 on January 1, 1919. The Fund has \$11,000 in Liberty Bonds.

THE A. PH. A. GENERAL FUND.

On February 26, 1909, the Council directed that \$5,000.00 of the current funds of the Association be invested by the Treasurer in some interest-bearing security, to be approved by the Finance Committee and the Chairman of the Council (see Proc., 1909, p. 449). In accordance with this order the Treasurer reported on May 26, 1909, having purchased five \$1000.00 St. Louis, Mo., 4 per cent. bonds at 103⁵/₈ and accrued interest. Again, on November 15, 1909, the Treasurer, in accordance with an order of the Council (see Motion No. 11, p. 449), invested \$5000.00 of the current funds of the Association in St. Louis public buildings and public works 4 per cent. gold bonds.

The following funds are held in trust by the A. Ph. A.: (1) Wm. Procter, Jr., Monument; (2) College Prize; (3) Rice Memorial; (4) Jos. P. Remington Honor Medal Fund.

THE WM. PROCTER, JR., MONUMENT FUND.

At the fifty-second annual meeting held at Kansas City, Mo., September, 1904, it was resolved to solicit subscriptions for a memorial monument to be erected in the Smithsonian Grounds at Washington, D. C., to the memory of William Proc-

ter, Jr., if possible in 1917, the centennial anniversary of his birth. A committee was appointed to take the matter in charge, which since that time has been active in soliciting subscriptions. The names of contributors have been published from time to time in the annual volume of Proceedings (see Proc., 1906, p. 63; Proc., 1907, p. 98).

In September, 1907, at the annual meeting held in New York City, the Association directed that all moneys collected for the William Procter, Jr., Monument Fund be turned over to the Treasurer of the A. Ph. A. to be deposited on interest for the benefit of said fund (see Proc., 1907, p. 99). The Treasurer of the A. Ph. A., in his annual report for 1908-1909, reports having received on January 27, 1909, the sum of \$3,413.33 from the Treasurer of the Committee, Benj. T. Fairchild, which was placed on time deposit in the International Bank of St. Louis, Mo., for a period of twelve months at 4 per cent. per annum (see Proc., 1909, p. 472). This certificate has been renewed annually. The total sum to the credit of this fund, according to the Treasurer's report on January 1, 1919, amounted to \$9,243.20. The Fund has \$8,000 in Liberty Bonds.

RICE MEMORIAL FUND.

A joint committee was appointed by the Chairman of the Committee of Revision of the U. S. P., on June 26, 1901, to report to the Board of Trustees and Committee of Revision upon a suitable plan for honoring the memory of Dr. Charles Rice.

It was decided, after hearing the report of the Committee, to erect a monument over Dr. Charles Rice's grave and to prepare a memoir containing a biographical sketch of his life.

The monument over the grave was dedicated July 7, 1903, with the members of the Board of Trustees among those present. The memoir, a volume of sixty-four pages, was published and distributed in 1904.

March 22, 1905 (see Item No. 428 in Abstract of Minutes of Board of Trustees 1900-1910), on motion of Dr. H. C. Wood, the balance of the Rice Memorial Fund was accepted as voted by the Revision Committee and the Chairman was requested to appoint a committee of one, to be known as the Rice Memorial Committee, to take charge of this fund and deposit it in the name of the Board of Trustees of the U. S. P. Convention. This motion was carried and the Chairman appointed Mr. S. A. D. Sheppard to constitute the committee.

Under date of November 22, 1910, Dr. A. R. L. Dohme, representing his father, Dr. Charles E. Dohme, the retiring chairman of the Board of Trustees, turned over to Chairman James H. Beal, of the present Board, bank-book No. 55828, of the Boston Penny Savings Bank, with an account, amounting to one hundred and forty-nine dollars and forty-three cents (\$149.43) to its credit on October 1, 1910, the same standing in the name of Samuel A. D. Sheppard, Committee of Trustees, of the United States Pharmacopœial Convention.

June 6, 1913, the board of Trustees of the U. S. P. C. inquired of the A. Ph. A. whether the organization would accept the custodianship of the Rice Memorial Fund (U. S. P. C. Board of Trustees minutes, Item 488, p. 365). The Council of the A. Ph. A. voted to accept the Fund in trust.

The transfer was made November 22, 1913, the amount being \$168.21.

January 1, 1919, the fund amounted to \$183.65.

THE COLLEGE PRIZE FUND (MOTTER FUND).

On August 4, 1905, Dr. Murray Galt Motter, of Washington, D. C., placed in the treasury of the American Pharmaceutical Association the sum of \$25.00, the same to be awarded as prizes by the National College of Pharmacy to the members of the classes of 1906-1907-1908-1909-1910 of said College.

This money, deposited in the Boston Penny Savings Bank in the name of the Treasurer of the A. Ph. A., is held as a special fund, to be drawn upon as the prize students shall be named by the National College of Pharmacy and their applications for membership in the American Pharmaceutical Association shall be approved.

Up to the present time no demands have been made on the Fund. January 1, 1919, the Fund amounted to \$41.71.

JOSEPH REMINGTON HONOR MEDAL.

At the April 8, 1918, meeting of the New York Branch of the A. Ph. A., a special committee reported the following recommendations which were adopted by the Branch and later by the Council of the A. Ph. A.:

"That a gold medal to be known as the Joseph P. Remington medal and suitably engraved be awarded to the man or woman who has done most for American Pharmacy during the preceding year or whose efforts during a number of years have culminated to a point during the preceding year where the result of these efforts would be considered as being the most important and advantageous for American Pharmacy. That no bar be placed as to the candidate's profession or kind of work accomplished.

"That the Special Committee on the Pharmacy Honor Medal be empowered, in order to make the presentation of this award permanent and perpetual, to raise a fund of \$1000.00 and in addition sufficient money to pay the initial expenses of die, postage, etc. That this money be raised by obtaining a contribution of \$100.00 from the Branch treasury and the rest to be made up by voluntary contributions from the members and firms in New York City and vicinity. That the \$1000.00 fund be invested in Liberty Bonds, which bonds are to be held in trust by the Treasurer of the American Pharmaceutical Association.

"That the medal be awarded by a standing committee consisting of all the past presidents of the American Pharmaceutical Association, and in case the number of living past presidents is less than five the senior past vice-presidents of the American Pharmaceutical Association are to be drawn upon in sufficient number to create a committee of five. The Secretary of the New York Branch is to act as Secretary of this standing committee.

"That the medal be presented by the Senior Past President of the Local Branch or in his inability to do so by other past-presidents in the order of their seniority.

"That the New York Local Branch of the American Pharmaceutical Association take the matter in hand to the extent of devoting the regular April meeting annually to the presentation of this medal."

The fund is now in a \$1,000 Liberty Bond.

All bonds of the Association are registered in the name of the American Pharmaceutical Association and kept in the association safe deposit box.

For a detailed account of each of the funds of the Association, see the annual reports of the Treasurer.

HARRY M. WHELPLEY, *Treasurer.*

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REPORT ON THE PROGRESS OF PHARMACY 1917

By HENRY V. ARNY

WITH THE COLLABORATION OF

CHARLES W. BALLARD
GEORGE D. BEAL
KARL S. BURKETT
ZADA M. COOPER
MAY O'C. DAVIS
GEORGE C. DIEKMAN
HERMANN ENGELHARDT
ROBERT P. FISCHER
IVOR GRIFFITH

FANCHON HART
JEANNOT HOSTMANN
JULIUS A. KOCH
WILLIAM A. PUCKNER
OTTO RAUBENHEIMER
LOUIS SAALBACH
HUGO H. SCHAEFER
CLYDE M. SNOW
JOHN K. THUM

ARNO VIEHOVER

INTRODUCTORY

In presenting this Year Book it is with a sense of gratification that we are reaching the stage when the report on the progress of pharmacy of a certain year will be presented to the members of the Association some time during the following year. This, while scarcely accomplished by the present volume, will be realized, we hope, with the publication of the 1919 volume.

Reaching this point where more attention can be paid to details and less to the problem of time, the Reporter desires to express his hope that all friends of the Year Book will assist in making it as complete as possible. He urges the secretary of each State pharmaceutical association to send him a copy of the 1918 and subsequent proceedings, that the original articles therein may be abstracted. He likewise requests each reader to send him reprints of articles published in scientific journals, other than pharmaceutical, whenever such articles have even an indirect pharmaceutical bearing.

In closing, the Reporter desires to express warm thanks for the fine work done by his collaborators and to note from the list the absence of the name of Brooke J. Davis, now a Pharmacist Mate in the Navy and located at a distant point.

NEW YORK, Oct 1, 1918.

PHARMACY

A—GENERAL SUBJECTS

PHARMACOPŒIAS AND FORMULARIES.

Pharmacopœial Standards.—*Unification of.*—In an address before the Homeopathic Medical Society of the County of Philadelphia, G. M. Beringer discussed the pharmacy of the Bible and the history of the United States Pharmacopœia. He then spoke of the two homeopathic pharmacopœias that are standard in this country, pointing out the unlikelihood of recognition of either in the Federal Food and Drugs Act until they are consolidated.

He raises the question if it will not be feasible to have homeopathic pharmacy represented at the 1920 pharmacopœial convention. If that were accomplished, the selection of a sub-committee on homeopathic standards would not be impossible.

If such a merger is not feasible, there should be at least a joint harmonizing committee representing the revision of both pharmacopœias in order to provide uniform standards for those drugs and preparations used by both schools of medicine.—*Am. J. Pharm.*, 89 (1917), 569.

Pharmacopœias, Pharmacists and Physicians.—T. E. Satterthwaite in a paper read before the New York Branch compares the new U. S. P. with the old. He discusses this matter from the point of view of a practical physician with fifty years' experience. Finally, the author gives three points on which the physician and pharmacist should come together; (a) closer fellowship; (b) information on technical questions; (c) establishment of the ethical or first-class drug store as apart from the non-ethical or second-class stores.—*J. Am. Pharm. Assoc.*, 6 (1917), 611. (H. H. S.)

United States Pharmacopœia.—*Awakening the Physician's Interest in.*—A. F. Marquier suggests that the pharmacist study the Pharmacopœia and inform the physician of the important changes, additions and deletions appearing therein.—*Proc. N. J. Pharm. Assoc.*, 47 (1917), 87. (J. H.)

United States Pharmacopœia.—*Suggestion for the Tenth Revision of.*—F. B. Kilmer suggests as a method of co-operative revision that the Committee of the Ninth Pharmacopœial Revision assign, some time in advance of the next revision, to such organizations as are able and willing to lend their assistance, certain problems connected with the revision, such as assay processes, purity rubrics, etc. As possible collaborators are mentioned, colleges of pharmacy, the American Pharmaceutical Association, the American Chemical Society, the American Drug Manufacturers' Association and similar bodies.—Proc. N. J. Pharm. Assoc., 47 (1917), 87. (J. H.)

United States Pharmacopœia.—*Work of the American Drug Manufacturers' Association for.*—F. B. Kilmer calls attention to the work of the committee on standards and deterioration of the American Drug Manufacturers' Association and the latent possibilities of the results of its investigations on the rate of deterioration of galenical preparations and on pharmacopœial tests. This work will be placed at the disposal of the next U. S. P. revision committee.—Proc. N. J. Pharm. Assoc., 47 (1917), 86. (J. H.)

U. S. P. IX.—*Assays of.*—J. R. Rippetoe in a paper read before the New York Branch of the American Pharmaceutical Association makes a number of comments on the chemistry of various assays in the Pharmacopœia. He thinks that there should be created continuous committees to carry on co-operative work as is done by the Association of Official Agricultural Chemists.—J. Am. Pharm. Assoc., 6 (1917), 463. (H. H. S.)

U. S. P. IX.—*Analytical Methods of.*—F. Klein in an address before the New York German Apothecaries' Society discussed some of the tests of the new Pharmacopœia. He thinks that under acetone, there should be given a test for wood alcohol and he recommends for this purpose the addition of urea, which will not dissolve in absolutely pure acetone containing even a trace of wood alcohol. He suggests as a test for distinction between glacial acetic acid and acetic anhydride the warming of the sample with selenium dioxide. With acetic anhydride, a red precipitate results; with glacial acetic acid no color change occurs. In assays with immiscible fluids, he prefers acetic ether to chloroform because of the tendency to emulsionize possessed by the latter solvent.—D.-A. Apoth. Ztg., 38 (1917), 52.

U. S. P. IX.—*Biological Assays of.*—J. Bougault continuing his review of the new Pharmacopœia devotes a special paper to the biological assays found therein, stating that it is the first time such assays have appeared in a pharmacopœia; he translates the several monographs in full, for the benefit, he says, not only of savants but also of those in pharmaceutical manufacturing. He expresses the opinion that the pharmacist making preparations in small quantities for the needs of his store, will find no use for biological assays, if he starts his preparation with strictly official ingredients.—J. pharm. chim., 15 (1917), 107.

U. S. P. IX.—*Botanical Nomenclature of.*—O. A. Farwell gives an important critical paper on the botanical nomenclature of the Pharmacopœia, expressing the opinion that the Revision Committee has apparently overlooked uniformity in system of nomenclature. While the American Code was the system which the Committee intended to follow, there are numerous instances where the Vienna Code has been used and sometimes neither code has been adhered to. The trinomials of the American Code should not be applied to the older botanical titles wherein the authors described varieties and never intended the latter subdivision to be construed as a subspecies. Enforcement of the rules of classification has not been regarded when it would result in a repeating binomial. Geographical names should be capitalized. The article gives a long list of improved titles suggested by the author, as well as detailed reasons for the changes suggested.—Drug. Circ., 61 (1917), 173.

U. S. P. IX.—*Chemical Monographs and New Chemicals of.*—O. Raubenheimer discusses the features of the chemicals of the new Pharmacopœia, commenting favorably on the official abbreviation, the formulæ of organic chemicals and the purity rubric. He also gives a list of the chemicals that have been introduced into the new edition.—J. Am. Pharm. Assoc., 6 (1917), 524.

U. S. P. IX.—*Diagnostic Reagents and Clinical Tests of.*—J. Diner in a paper read before the New York Branch criticises the diagnostical reagents and clinical tests as described in U. S. P. IX. He bases these criticisms chiefly on the fact that some antiquated reagents and tests have been incorporated while more up-to-date ones have been omitted. He compliments, however, the Revision

Committee upon its attempt to standardize diagnostic reagents.—J. Am. Pharm. Assoc., 6 (1917), 613. (H. H. S.)

U. S. P. IX.—*Drugs of.*—S. B. Penick in a paper read before the New York Branch discusses the crude drugs of the Pharmacopœia from a commercial point of view. He divides his remarks into a number of sub-topics: standards; market values; difficulties in securing supplies of foreign drugs; difficulties in securing supplies of domestic drugs. He concludes by saying that he is inclined to think that the crude drugs of the U. S. P. IX, on account of the higher plane they now occupy and because of the standards maintained for them, are likely to increase in consumption, and in usefulness. They will be real factors in the mitigation of sickness and disease.—J. Am. Pharm. Assoc., 6 (1917), 695. (H. H. S.)

U. S. P. IX.—*The Drug Chemist and.*—H. C. Fuller in a paper read before the Washington Branch criticises the Pharmacopœia from the drug chemist's point of view. He deplores the fact that so many important drugs have been deleted and suggests that there might have been a lack of co-ordination in the relations between some of the substances admitted and deleted. He concludes that as a standard for drugs the U. S. P. IX is going to be altogether too limited in scope while devoting entirely too much space to chemical reagents, food products, etc.—J. Am. Pharm. Assoc., 6 (1917), 66. (H. H. S.)

U. S. P. IX.—*The English of.*—G. M. Beringer, Jr., cites some examples of imperfect English found in the Pharmacopœia and expresses the hope for improvement in the next revision. Some of the examples mentioned are: "Microscopical description of drugs;" "when dried in a desiccator over sulphuric acid;" "the posterior lobe obtained from the pituitary body of cattle, cleaned, dried and powdered;" "the purified fat of the sheep, freed from water."—Proc. N. J. Pharm. Assoc., 47 (1917), 35. (J. H.)

U. S. P. IX.—*A French Review.*—J. Bougault publishes a comprehensive review (11 pages) of the salient features of the ninth edition of the United States Pharmacopœia. When expressing personal opinions, he usually compares it favorably with the Codex.—J. pharm. chim., 15 (1917), 48 and 80.

U. S. P. IX.—*Galenicals of.*—G. M. Beringer discusses in detail the reasons for changes made in all U. S. P. galenicals except extracts and fluidextracts. (See Year Book A. Ph. A., 1916, p. 3.)—Proc. N. J. Pharm. Assoc., 47 (1917), 88. (J. H.)

U. S. P. IX.—*Pharmaceuticals of.*—J. Leon Lascoff in a paper read before the New York Branch reviews the changes in the U. S. P. IX as compared to the U. S. P. VIII. He also discusses the question as to whether these changes are practical from the point of view of the dispensing pharmacist.—J. Am. Pharm. Assoc., 6 (1917), 469. (H. H. S.)

U. S. P. IX.—*Pharmacy Monographs of.*—Thomas Maben finds upon comparison that the new Pharmacopœia gives more attention to modern medical practice than the B. P. 1914. As an example the new U. S. P. has a sterile distilled water as well as ordinary distilled water, which is beneficial for special intravenous and general hypodermic injections. He finds the U. S. P. gives a greater margin for possible deterioration as in stronger ammonia water there is an allowance of 2 per cent. loss of ammonia whereas the B. P. requires the impossible 32.5 per cent. of ammonia. Due to some irregularity the fluidextract of ipecac U. S. P. IX represents 113 per cent. of the drug which must yield not less than 1.75 per cent. of alkaloids; a greater anomaly occurs in the B. P. under belladonna, the root of which rarely contains more than 0.5 per cent. alkaloid, but the liquid extract requires 0.75 per cent. of alkaloid. Guinea pigs are substituted for frogs in the required biological tests of such toxic drugs as digitalis, squill and strophanthus. Mr. Maben is at loss to know why suprarenalum siccum standardized chemically should contain 0.4–0.6 percent. of active principle while assayed biologically it contains the active principle equivalent to 1 per cent. of adrenalin. He also fails to understand the replacement of "c.c." by "mil." If "c.c." is graduated at 15.5° C. and "mil" at 4° C., then all liquids must be cooled before measuring by mils or the readings will be incorrect.—Chem. and Drug., 89 (1917), 71. (M. O'C. D.)

U. S. P. IX.—*Quid Pro Quo in.*—In connection with his paper on substitution (see this Year Book, p. 39) Otto Raubenheimer presented another paper under the title "Quid Pro Quo," meaning "one for another," in good English. In this paper he states the

regular lists of drugs and medicines which could be used for one another always formed a part of old works on pharmacy and medicine and that the present Pharmacopœia, while not offering a list of such substances, nevertheless sanctions the use of numerous "substitutes," such as two forms of alum, three sources of sugar, six varieties of ginger, and the use of sodium instead of potassium compounds in compound solution of cresol, in solution of magnesium citrate and in pills of ferrous carbonate.—J. Am. Pharm. Assoc., 6 (1917), 59. (L. S.)

National Formulary, Fourth Edition.—*Botanical Nomenclature of.*—O. A. Farwell states that the nomenclature adopted by N. F. IV is not entirely consistent, in that titles are based in some cases upon the Vienna Code whereas in others the American Code is followed. The latter predominates. The botanical rule of priority for names has not been adhered to in many instances. Geographical titles, being proper names, should be uniformly capitalized. Trinomial titles which, under the American Code, are used to designate subspecies, have been used as designations where the author quoted published a variety and not a subspecies. Hyphenated words as snake-root (*Asarum*) should be contracted into one word or separated into two. The article gives a long list of changes suggested by the author, each title being considered separately with reasons why the suggested change is advisable.—Drug. Circ., 61 (1917), 229. (C. W. B.)

N. F. IV.—*Criticism of Some Synonyms of.*—Friedenberg and Davies, while approving of the inclusion of synonyms in the new National Formulary, object to giving to compound elixir of pepsin and rennin, the synonym, "essentia pepsini N. F. III," since the latter contained 11 per cent. while the former contains 18.5 per cent. of alcohol. They object to giving the "elixir of terpin hydrate and diacetylmorphine" the synonym "elixir of terpin hydrate and heroine N. F. III," since the latter is a trade-marked name. They also criticise the latter synonym, since the narcotic strength of the new preparation is materially less than was the strength of the old elixir.—J. Am. Pharm. Assoc., 6 (1917), 481.

N. F. IV.—*Newer Preparations of.*—G. M. Beringer gives a concise résumé of all of the new titles and formulæ appearing in

the new edition of the National Formulary.—Proc. N. J. Pharm. Assoc., 47 (1917), 91. (J. H.)

U. S. P. IX and N. F. IV.—*As Food Standards.*—C. W. Ballard finds both books in most particulars very well suited to the needs of the analysts but troublesome situations arise from the clause in the introduction of each which restricts the application of U. S. P. and N. F. standards to articles intended for medicinal use.

Usually the use to be made of an article should determine whether it must comply with the standards of the Pharmacopœia and the Formulary but there is no apparent reason "why food concerns may sell a mixture of cinnamon bark and cassia buds as ground cinnamon while the drug trade must supply cinnamon U. S. P. when ground cinnamon is specified." Perhaps the reason which permits one standard for foods and another for medicines, both intended for human consumption, is that the drug trade is governed by the U. S. P. and N. F. but food industries are regulated by the standards of the U. S. Department of Agriculture Circular 19 and subsequent Service and Regulatory Announcements.

The paper contains a table covering articles described in the Pharmacopœia or the Formulary and also in Circular 19 showing anomalies between the two sets of standards and adding, "Aside from the question as to whether these dual standards are unduly favorable to the food manufacturers and discriminating toward the druggist, they tend to complicate the work of the analyst."—J. Am. Pharm. Assoc., 6 (1917), 792. (Z. M. C.)

U. S. P. IX and N. F. IV.—*Some Notes on.*—J. P. Snyder discusses the new Pharmacopœia and the new Formulary from the standpoint of the work's chemist. He believes that a standard of 2 per cent. total alkaloids would be none too high; that the standards for tincture of ginger should be 1.25 to 1.75 per cent. of solids and about 90 per cent. of alcohol; that there should be a standard set for beef, iron and wine, N. F.; that the frog method of the biological assay of heart tonics brings up in New York the fact that according to the game laws of that State, from March 1 to June 1 is a closed season for frogs; that the pituitary assay is rendered uncertain because of the unreliability of standard histamine products; that standard ouabain for digitalis testing and standard levo-methylaminoethanolcatechol for suprarenal testing are extremely difficult to obtain. He points out the difficulty in getting

herbs with the minimum amount of stems; the fact that little of the calcined magnesia of the market comes up to official requirements; and that methyl red as an indicator gives results that are four to five per cent. too low.—Proc. N. Y. S. Pharm. Assoc., 39 (1917), 224.

U. S. P. IX and N. F. IV.—*Syrups and Elixirs of.*—E. Fullerton Cook in a paper read before the Philadelphia Branch tabulates all the syrups and elixirs of the new Pharmacopœia and Formulary and notes all the variations in formula and changes method of manufacturing as compared to the old U. S. P. and N. F.—J. Am. Pharm. Assoc., 6 (1917), 75. (H. H. S.)

U. S. P. and N. F. *As Text Books in Pharmacognosy.*—W. F. Gidley believes that a book especially intended for pharmacognosy is almost a necessity. It may be possible to find all of the information in the Pharmacopœia and the Formulary but from the pedagogical standpoint neither is arranged correctly. Using them as texts would be "like studying botany out of the dictionary." Good illustrations are most valuable aids to both teacher and student and neither book has any. However, the Pharmacopœia and the Formulary are not to be disregarded altogether, for they are excellent reference works.—J. Am. Pharm. Assoc., 6 (1917), 809. (Z. M. C.)

U. S. P. and N. F.—*Revisions of.*—Mrs. St. Claire Ransford Gay calls attention to some of the excellencies in the newest revisions of these two standards. She advocates that the government should publish future revisions and that those who do the work should be paid by the government and be provided with adequate library and laboratory facilities. Further, she believes that the Pharmacopœia should be published in portions, as the work of revision is completed, in order that pharmacists need not be forced to familiarize themselves with so much in a few short months.—J. Am. Pharm. Assoc., 6 (1917), 601. (Z. M. C.)

U. S. P. and N. F.—*Suggestion as to a Propaganda.*—In a paper read before the Section on Practical Pharmacy and Dispensing at the Atlantic City Meeting, Emil Roller made the suggestion that a different edition of both of these standard works should be published for the use of the physician. Such editions, to be more

concise, working formulæ omitted and a grouping made according to therapeutic use. The writer contends that such a proposition would be met with favor by the medical profession and would do more to popularize the preparations listed therein.—J. Am. Pharm. Assoc., 6 (1917), 266. (L. S.)

British Pharmacopœia.—*Withdrawal of Preparations Containing Glycerin and Sugar.*—In an editorial the statement is made that pharmaceutical advice was not sought before taking this radical step and that legal complications under the Food and Drugs Acts may result from the sale or dispensing of the alternative preparations suggested if the latter are sold under titles recognized by the pharmacopœia. The Medical Council declines to officially authorize the alternative preparations and medical men still continue to prescribe the withdrawn articles. The pharmacist is under the necessity of consulting with the physician who continues to prescribe such preparations and obtaining his consent for use of an alternative. The condition also involves burdensome explanations to the laity so that they may fully understand differences in physical properties of preparations they are accustomed to purchasing. The British Pharmaceutical Society proposes to give wider publicity to the withdrawn preparations and their alternatives. Pharm. J., 99 (1917), 48. (C. W. B.)

Pharmacopœial Monographs.—*Those Relating to Drugs.*—J. W. Moll states that the French Pharmacopœia gives neither micro- nor macroscopic descriptions of drugs. The Swiss Pharmacopœia merely indicates the properties of the vegetable drugs mentioned. The American, British, German and the third edition of the Dutch Pharmacopœias give elaborate but incomplete descriptions of the crude drugs.

Dr. Moll initiated a system which has been followed in the 4th edition of the Dutch Pharmacopœia as well as the homeopathic standard. His description includes the micro- and macroscopic characters given in the order of their importance without the omission of even the least important property.

A translation of the capsicum monograph from the Dutch Pharmacopœia is cited to show how Prof. Moll would have all the drugs described. Several sketches of both the gross and microscopic characters are included in the same article as examples of the illustrations which the author would introduce into the official

description.—Pharm. Weekblad, through Chem. and Drug., 89 (1917), 92. (F. H.)

Pharmacopœial Standards.—*Influence of the War on.*—Van der Wielen draws attention to the fact that due to war conditions standards laid down in modern pharmacopœias are now too exacting and limited, for many articles are difficult to get and if obtainable are very inferior and costly; he cites for example quinine sulphate which to be truly standard must have all traces of cinchonidine removed, though this alkaloid does not destroy the activity of the drug especially if used as medicament for malaria. Under present conditions, the question arises what would be the limit of impurities allowable in pharmacopœial medicaments? In answer to this question a list of articles not answering requirements of the pharmacopœia and their impurities has been published by a Dutch wholesale house. In the list are albumin, seldom entirely soluble; bismuth subnitrate, containing traces of chlorine and ammonia; chrysarobin, which has too much ash; tartaric acid, containing lead and potassium salts. To combat this, Prof. Van der Wielen suggests that the committee of revision of the Dutch Pharmacopœia consider these facts, also the fact that national and foreign chemical industries after the war are going to be entirely different, and that they fix the tests of the pharmacopœia to fit both conditions. What is true of Holland is true of the United States; regardless of the great amount of raw material we have at our disposal for the manufacture of medicaments, products from new sources will enter this country and will contain impurities not yet considered.—Chem. and Drug., 89 (1917), 72. (M. O'C. D.)

EDUCATIONAL PHARMACY.

Commercial Training for Pharmacists.—R. P. Fischelis in a paper presented at the New York Branch gives reasons why the study of commercial pharmacy is important and the advantages gained therefrom.—J. Am. Pharm. Assoc., 6 (1917), 466.

(H. H. S.)

Degrees.—*The Passing of the Ph.G. and Ph.C.*—Recently the committee on academic and professional degrees of the Association of American Universities recommended that degrees be abolished

for all college courses not requiring at least four years for graduation. Several faculties have approved the action of the committee and so important a question concerns the entire profession of pharmacy. L. E. Sayre and C. F. Nelson think that, though all pharmacists may resent the idea that in the future Ph.G. and Ph.C. should not be recognized as degrees, the reasons for the committee's action are fundamentally sound and inevitable in view of the scientific development as well as the demand for a large amount of cultural work as an essential for admission to the profession.

A certificate showing the completion of the same amount of work for which a degree is now given would be just as good for practical purposes providing state boards of pharmacy would recognize it. If the recommendation of the committee should become the rule, schools of pharmacy could not grant degrees on a lesser requirement without a corresponding loss of dignity and standing.

The time spent in preparatory and professional schools must be increased if pharmacy is to hold its own with other professions.

No possible action can detract from the value of degrees already conferred but their value would deteriorate if they should be given as now after a degree had been defined as consisting of not less than four years' work.—J. Am. Pharm. Assoc., 6 (1917), 1049.

(Z. M. C.)

Lecture Charts.—Fanchon Hart describes lecture charts prepared by her for lectures in botany and physiology. She uses sheets of mounted drawing paper at least 36 inches square, outlines the sketch in black water-color and tints with appropriate water-color paints, using medium-sized brushes of red cow's hair and a good-sized wash brush of camel's hair.—Proc. N. Y. S. Pharm. Assoc., 39 (1917), 231.

Pharmaceutical Education.—*Relationship to Higher Education in Medicine.*—C. F. Nelson speaks of the remarkable progress in medical education since 1905 and raises the question as to why pharmacy does not also respond to call to higher education. "The drug store," he says, "has always been the local laboratory for physicians' prescriptions. Why may it not in the future function as the local chemical, bacteriological, sanitary and industrial laboratory?"—J. Am. Pharm. Assoc., 6 (1917), 389.

Pharmaceutical Education.—*Success or Failure of Higher.*—In a paper on this topic C. Ferdinand Nelson discusses the advanced educational requirements in pharmacy. He calls attention to the need of increased unity and stability in pharmaceutical professional life.—*Am. J. Pharm.*, 89 (1917), 23. (R. P. F.)

Practical Pharmacy.—*Some Ideas about the Teaching of.*—Teachers need patience and tact to meet students' demands for only what is practical. Laboratory preparations must be chosen because they involve some practical point even if it may not be practical to make each one in a retail pharmacy, states Zada M. Cooper. Technique can be developed along with regular courses in manufacturing or galenical pharmacy and be more interesting than the abstract method. Familiarity with weights and measures of all sorts is acquired by having them in the individual equipment and by using them in the regular work.

An affiliation between pharmaceutical laboratory and hospital dispensary is a great advantage, giving students opportunity to make many preparations otherwise out of the question and opportunity to prepare large quantities as well as small. Knowing it is not just experimental, a feeling of the necessity for absolute accuracy can be aroused; conscience and a feeling of responsibility to humanity is developed.

Preparing a laboratory manual for students is not good pedagogy. It fosters memorizing, making work easier for poor thinkers, but does not develop reasoning powers and give students a chance to think things through themselves. "What we should seek to impart is not so much learning as the spirit of learning."—*J. Am. Pharm. Assoc.*, 6 (1917), 1065. (Z. M. C.)

Professional Pharmacy.—*A Plea for the Recognition of.*—At the meeting of the New Jersey Pharmaceutical Association, E. G. Eberle deplored the lack of recognition of pharmacy by the National Academy of Sciences in its National Research Council, and by the United States Army and Navy. He feels that the strongly commercial attitude taken by many retail druggists is a contributory factor to this unfortunate state of affairs. "Druggists," he says, "can only expect professional recognition because of professional service and pharmacists cannot hope for continued professional recognition unless they continue to give attention to the practice of pharmacy."—*Pract. Drug.*, July, 1917, 25.

Professional Training for Pharmacists.—At the meeting of the Texas Pharmaceutical Association, E. G. Eberle gave an address in which he cited the achievements of those famous pharmacists and pharmaceutical apprentices, Scheele, Davy, Pasteur, Calvert, Labarraque, Frasch, Conner, Lloyd, Serturmer, Pelletier and Caventou. He then pointed out that pharmacists are too modest in asserting their professional attainments and he urged that they give more attention to the purely pharmaceutical side of their calling.—Pract. Drug., June, 1917, 23.

Research in Pharmacy Colleges.—H. V. Army gives some of the reasons why pharmaceutical educators are not doing the desired amount of research (a) a mass of routine work apart from the regular hours of instruction; (b) a meager income that has to be augmented from outside sources; (c) abundant opportunity to secure such profitable work. As remedies the following are suggested: First, that it should be expected of each teacher that each year he publish some article reporting original research. Second, if college authorities demand this research, it is obvious that they should encourage such work rather than hinder it by placing greater and greater responsibility on willing shoulders. Third, research fellowships, either in pure or applied science, should be established at each college of pharmacy and these fellows should perform their investigations under the directions of the regular members of the faculty, who thus will have the opportunity of displaying originality as demanded in the first requirement given above. Fourth, a systematic campaign should be inaugurated among the philanthropic public, educating it to the importance of pharmaceutical research.—C. U. C. P. Al. J., 24 (1917), 171.

(J. H.)

Schools and Colleges of Pharmacy.—*Objections to Privately Owned.*—Edward Spease presents arguments in favor of university schools of pharmacy, which was read before the joint session of Section on Education and Legislation, American Conference of Pharmaceutical Faculties and the National Association of Boards of Pharmacy, at the Atlantic City meeting of the American Pharmaceutical Association.—J. Am. Pharm. Assoc., 6 (1917), 149.

(L. S.)

Scientific Pharmacy.—*The Being and Aim of.*—Under this title H. Zornig gave an address upon his assuming the chair of

pharmacy at the University of Basel. He brought out the fact that pharmacognosy was really the foundation of botany, since the search for and study of medicinal plants was the beginning of plant research. He stated that pharmacognosy as an exact science began only with the use of the microscope and he finally related the important rôle pharmacy played in the development of the science of chemistry.—D.-A. Apoth. Ztg., 38 (1917), 1 and 29.

Spelling.—*Weakness of Pharmacy Students in.*—To become a good speller requires early teaching of the fundamentals, which, says C. H. LaWall, "include the training of the eye, the ear and the mind so as to produce a composite effect in the direction of accuracy of the arrangement of the letters of words in conformity with customs existing in any given locality."

Many changes proposed by the Board for Simplified Spelling are commendable but they are adopted very slowly, perhaps because of the shock to the sensibilities of those who have learned to spell in the old way.

Visualization is an important element in good spelling and good spellers are among those who read much and more for profit than pleasure. The humor in the queer orders which druggists get is largely an attempt to spell names as they sound.

To illustrate the point that a certain amount of familiarity will stimulate visualization, Professor LaWall gives 27 different renderings of Quevenne's Iron, collected from answers to the question "What is the Synonym of Ferrum Reductum" propounded to a class in pharmacy. No special discredit attaches to these individuals, for spelling is not taught in colleges of pharmacy but it is an "index of the proportion of careless or inaccurate observers."—J. Am. Pharm. Assoc., 6 (1917), 1063. (Z. M. C.)

Student Laboratory Receipt Book.—L. N. Brown describes the form of receipt book used for checking the preparations made by students in the pharmaceutical laboratory of the New York College of Pharmacy. It consists of a small book containing 50 perforated white slips and 50 perforated yellow slips appropriately printed. When a preparation is ready to be handed in, the student fills out a white slip and by use of carbon paper gets a copy on the adjoining yellow slip. The white slip is torn off by the instructor and attached to the preparation for eventual recording

of its value and for final filing; the yellow slip is receipted and returned in the book to the student.—Proc. N. Y. S. Pharm. Assoc., 39 (1917), 237.

Study.—*Best Method.*—Those interested in teaching will find much information of value in the article by Frederick J. Wulling, under the caption "How to Study," and read before the joint session of Section on Education and Legislation, American Conference of Pharmaceutical Faculties and the National Association of Boards of Pharmacy, at the Atlantic City meeting of the American Pharmaceutical Association.—J. Am. Pharm. Assoc., 6 (1917), 149. (L. S.)

LEGISLATIVE AND GOVERNMENTAL.

Alcohol.—*Sale of Tax-Free.*—J. O. Burge in a paper read before the Nashville Branch gives the rules and regulations of the Internal Revenue Department allowing a druggist to sell tax-free alcohol. These are as follows:

First, no more alcohol must be used in the preparation than is actually necessary for the purpose of extraction, solution or preservation of the medicament.

Second, each fluidounce of the preparation must have an average U. S. P. dose for an adult of some drugs or drugs of therapeutical value, either singly or in combination.

The last part of the paper gives 17 recipes for preparing denatured alcohol for bathing purposes.—J. Am. Pharm. Assoc., 6 (1917), 539. (H. H. S.)

Alcohol.—*Sale of Tax-Free.*—Otto Raubenheimer makes very clear that the formulas that have been approved by the Internal Revenue Department for the preparation of denatured alcohol (mentioned in the foregoing article) may not be used by retail pharmacists without a federal alcohol license and in most states a State revenue license also. This list of seventeen formulæ is intended for the use of hospitals and other institutions that obtain their alcohol free of tax.—J. Am. Pharm. Assoc., 6 (1917), 700.
(Z. M. C.)

Boards of Medicine and of Pharmacy.—*Co-operation between.*—In discussing the proposition, made by the Committee on Modern

Pharmacy Law of the American Pharmaceutical Association, that the enforcement of all laws pertaining to the distribution, sale and use of drugs be subject to the control and supervision of State medical and pharmacy boards jointly and that these two boards in joint session elect a Drug Commissioner, E. H. Thiesing takes a stand heartily approving of the proposed measure.—J. Am. Pharm. Assoc., 6 (1917), 360.

Boards of Pharmacy.—*Failures at Examinations of.*—O. Raubheimer criticises the subjects covered by and language used in preparing State board examination questions as well as of the limited amount of time allowed the candidate.—Proc. N. J. Pharm. Assoc., 47 (1917), 66. (J. H.)

Compulsory Health Insurance.—J. H. Beal in an address before the Illinois State Pharmaceutical Association discusses the proposed compulsory health insurance legislation laying particular stress on the "model" law proposed by the American Association for Labor Legislation. This document consists of fifty-nine sections, many interlocked with the provisions of various other sections. It provides for graded cash payments in case of sickness in proportion to the employee's salary in addition to medical treatment, etc.—J. Am. Pharm. Assoc., 6 (1917), 701. (H. H. S.)

Compulsory Health Insurance.—H. B. Mason sounds a strong note of warning, pointing out that the measure if enacted into law would not only sound the death knell of the drug business, but would also be a detriment to the persons supposedly benefited; the laborer, whose earnings are not more than \$1200 per annum.—J. Am. Pharm. Assoc., 6 (1917), 881.

Paige Bill.—*Discussion of.*—F. E. Stewart in a paper read before the Philadelphia Branch of the A. Ph. A. gives the text of the Paige Bill, relating to a proposed revision of the patent law, and explains its meaning. He states that the bill provides that after it is passed no patents can be granted for the kinds of chemical products mentioned in the bill, but processes for producing the same may be granted, and that the patentee of a new process for manufacturing any one of the said kinds of chemicals shall manufacture and produce the same in the U. S. within two years after

the patent has been granted. He goes on to show in detail how this law would work out if put into effect.—J. Am. Pharm. Assoc., 6 (1917), 122. (J. H. S.)

Paige Bill.—*Objections to.*—C. M. Woodruff in a paper presented before the Indianapolis Branch after describing the history of the U. S. patent laws explains the new Paige Bill and its provisions. He thinks that it seems unexplainable that such a bill should have been introduced and seriously considered and states that if such a measure as the Paige Bill becomes a law new products may be discovered but the processes of making them will be kept secret and in more than one case this secret will be buried in the grave of the inventor.—J. Am. Pharm. Assoc., 6 (1917), 475.

(H. H. S.)

Patents on Products.—*Objections to.*—J. W. England in a paper read before the Philadelphia Branch of the A. Ph. A. discusses the injustice of our present patent laws with reference to product patents. The author suggests six changes in our laws to overcome the present defects. He also thinks that when patent cases at court bear upon technical or scientific questions, a technical expert or referee should be called upon by the Government to decide.—J. Am. Pharm. Assoc., 2 (1917), 120. (H. H. S.)

Prerequisite Legislation.—*Its Effect on the Pharmacist.*—F. J. Wulling discussing the prerequisite situation in Minnesota states that the question is one of the minimum of requirements—the need thereof being conceded by practically all pharmacists in the state. In his opinion the “poor boy” will not be deprived by it of admission to the ranks of professional pharmacy. The former, if he possesses the needed desire, will find plenty of opportunity to obtain the necessary education.—Drug. Circ., 61 (1917), 239.

(J. H.)

Prerequisite Legislation.—*Enactment in Minnesota.*—The passage of a prerequisite law in Minnesota and data showing that 80 per cent. of the Minnesota pharmacists voting on the question of a prerequisite legislation favored such a measure, is discussed in an editorial article.—Am. J. Pharm., 89 (1917), 38. (R. P. F.)

Prerequisite Legislation.—*Answer to Opponents of.*—H. Schmidt deplotes the opposition shown in some quarters to prerequisite legislation and pleads for earnest support of the latter.—Proc. N. J. Pharm. Assoc., 47 (1917), 71. (J. H.)

Prescriptions.—*Labelling of Narcotic.*—R. H. Lackey brings up the interesting question whether a pharmacist is justified in putting the words "Not to be renewed" on the labels of prescriptions coming within the scope of the Harrison Law. The fact that this was quite common before the advent of the narcotic law, the aim of doctors undoubtedly being to control their prescriptions, and the fact that such labelling is now employed by most pharmacists to differentiate prescriptions coming under the narcotic law, make the use of this phrase somewhat confusing, as it will oftentimes give the patient the impression that they are taking "dope" when such is really not the case. This sometimes puts the physician in a false position. Mr. Lackey thinks it unwise for pharmacists to continue the use of such a label. The label of a narcotic prescription could just as well contain some other sign showing that it came under the provisions of the law. As the law absolutely forbids its renewal it is not the province of the pharmacist to emphasize it. The patient's welfare is in the hands of the doctor and any explanations that may be necessary should be forthcoming from him.—Proc. Penna. Pharm. Assoc., 40 (1917), 169. (J. K. T.)

Prescriptions.—*The Ownership of.*—In a London court the following case was brought to trial: A woman consulted a physician who gave her a prescription which she took to a firm of pharmacists to be dispensed. The prescription was not returned to her, and when her husband asked that it should be, this was refused, the pharmacists stating that they had undertaken at the request of the physician not to return his prescriptions to patients unless they were expressly authorized by him to do so. An action was brought by the husband against the pharmacists for the return of the prescription. In giving evidence, the physician stated that the course adopted by him with regard to prescriptions was taken for the protection of the public. He illustrated the danger of allowing prescriptions to be retained by the patient by saying that not infrequently a medicine ordered for an adult was given, without any physician being consulted, to an infant. He had re-

requested pharmacists to inform him whenever a patient asked for the return of a prescription, and he made a practice of writing on prescriptions which might properly be handed back without question the words, "return to patient." The lawyer pointed out that the prescription was of no value to them, and that they were only contesting the case on the question of principle and in order to keep faith with the medical profession. The judge held that no property in the document had passed to the plaintiff, as the prescription had been handed to the patient only in order that it might be conveyed by her to the pharmacists to be made up instead of the medical man himself sending it. The claim, therefore, was dismissed with costs.—J. Am. Med. Assoc.; through Pract. Drug., April, 1917, 42.

Ready-Made Medicines.—*Is the Publication of the Potent Drug Content Desirable?*—J. A. Levery discussed this question at the Atlantic City meeting of the American Pharmaceutical Association and answered it in the negative.—J. Am. Pharm. Assoc., 6 (1917), 356.

War and the Pharmacist.—C. A. Mayo states that no matter in what field the pharmacist may be engaged, he cannot escape from the effects of war. He must either serve in the ranks; pay additional taxes, if a retailer; have fewer pupils, if a teacher; and in all cases pay the higher cost of living. The author advises no young pharmacist to enter the medical corps, as present constituted.—J. Am. Pharm. Assoc., 6 (1917), 442.

War and the Pharmacist.—H. M. Whelpley in a paper read at a meeting of the Missouri Pharmaceutical Association discusses the part which the pharmacist is taking in this great war and deplores the lack of his recognition in the U. S. service.—J. Am. Pharm. Assoc., 6 (1917), 632. (H. H. S.)

Food and Drugs Acts.—*Enforcement of.*—C. L. Alsberg in a paper delivered before the Washington Branch describes the progress made by the Bureau of Chemistry in the enforcement of the Food and Drugs Act in its relation to pharmacy. This work falls into three groups:

1. The enforcement of the Sherley Amendment, under the supervision of a surgeon of the Public Health Service.

2. The control of pharmaceuticals.

3. The control of crude drugs.

Many attempted substitutes, especially those caused by the present abnormal war conditions, are described.—J. Am. Pharm. Assoc., 6 (1917), 468. (H. H. S.)

State Department of Health.—*Relation to the Retail Druggist.*—Wm. G. Tice, an official of the New Jersey State Department of Health, after giving a résumé of food and drug legislation and the policy of enforcement of the laws by his department, in summarizing, emphasizes that the said policy is chiefly an educational and constructive one; the health of the public is considered paramount to the pocketbook. Wilful offenders are prosecuted while unthinking ones are shown their error. The co-operation existing between the producers or dealers in food or drugs and the board of health has brought about greatly improved conditions.—Proc. N. J. Pharm. Assoc., 47 (1917), 39. (J. H.)

Public Health.—*The Pharmacist's Relation to.*—H. B. Smith urges that local health boards have pharmaceutical representation; he feels that a health board composed entirely of physicians is distinctly one-sided. The rest of the paper deals with the necessity of absolute cleanliness in the drug store.—Proc. N. Y. S. Pharm. Assoc., 39 (1917), 243.

Army Pharmacist.—*Justice to.*—J. W. England presents a paper in which he sets forth the reasons why pharmacists should have rank in the army. It is plain that the men of the army ought to have the same protection as the civilian has in being safeguarded against poisoning. Mr. England shows that pharmacy as practiced in the army at the present time is, to say the least, most elemental. If this is so the clinical results must necessarily be much inferior to those obtained in private practice. He then goes on to show just how valuable a well-trained pharmacist could make himself to the army physician. He also quotes in full an editorial which appeared in the "Journal of the American Medical Association" endorsing the plea that the Government authorize the creation of a Pharmaceutical Corps of the Army. If physicians, dentists, and veterinarians receive official recognition because of their technical training, the value of the trained pharma-

cist should not be ignored. Pharmacists should have rank commensurate with their importance because it is simple justice to the pharmacists themselves and because the efficiency of the army demands it. Mr. England voices the appreciation of all pharmacists by this recognition, on the part of the Journal, of real pharmacy and trained pharmacists. He then goes on to suggest that the Pennsylvania Pharmaceutical Association endorse the movement for the establishment of a commissioned pharmaceutical corps in the United States Army.—Proc. Penna. Pharm. Assoc., 40 (1917), 124. (J. K. T.)

Military Medicine.—*Triple Alliance in.*—J. Madison Taylor in a paper read at a joint meeting of the National Pharmaceutical Service Association states that there is no question that medicine, dentistry and pharmacy are on a par with each other in the objects they aim to achieve. He then gives a number of arguments as to why pharmaceutical corps should be created in the U. S. Army. The author thinks that the Edmonds Bill is an excellent and important one and that it would cover the field comprehensively and creditably.—J. Am. Pharm. Assoc., 6 (1917), 1051. (H. H. S.)

Pharmacist.—*Position in British Army.*—The first commissioned appointment for pharmacists in the British Army was made in 1915, and in 1916 pharmacists were permitted to rise to the rank of major. Every military hospital in Australia of 220 or more beds, every hospital ship, and every transport carrying 500 or more men must have a registered pharmacist in charge of the dispensary.—Chem. and Drug., 89 (1917), 820. (K. S. B.)

Pharmacist.—*Position in French Army.*—G. M. Beringer in a paper read at the joint meeting of the Philadelphia Branch and the National Pharmaceutical Service Association gives a detailed outline of the pharmaceutical division of the French Army, together with a history of the evolution of this corps. The article is illustrated with an elaborate chart showing the interrelation of service of the corps with the various other departments of the military service.—J. Am. Pharm. Assoc., 6 (1917), 967. (H. H. S.)

Pharmacist.—*Position in the German Army.*—Dr. R. Lennhoff states that one does not speak or see much of the pharmacists.

Among the many thousand troops of all classes one hardly notices the few men who, belonging to the class of upper officials, with the rank of officers, render an arduous and responsible service immediately behind the Front, mostly as chief pharmacists (oberapotheker) in the field hospitals and ambulance corps. As is also the case with medical officers, the majority of the pharmacists (apothekers) are men discharged from active service as soldiers after half a year under arms. They are prepared for their tasks in garrison hospitals. The purely pharmaceutical activity to which they are accustomed in civil pharmacies plays much less part in the field hospitals. They care for stocks of drugs, of furniture and of surgical instruments; they attend to disinfection and to the examination of water; and they even supervise the collection of medicinal herbs.—Chem. and Drug., 89 (1917), 85.

Pharmacist.—*Position in the Spanish Army.*—Pharmacist Major Landa, of the Spanish military medical service, describes interestingly the status of the pharmacist in the Spanish army. He states that the first mention of an apothecary in the Spanish army was in a decree of Philip V in 1704. At present, the administration of medicines is entrusted to a pharmaceutical corps consisting of 154 pharmacists: 4 colonels, 19 lieutenant colonels, 30 majors, 59 captains and 42 lieutenants. To enter the corps, the candidate must be a licentiate in pharmacy, which means graduation from a four years' course at the University of Madrid, or Barcelona or Grenada or Santiago de Galicia. In addition the candidate must pass a competitive examination and also take a special course in military training.

In the second paper, the author relates his personal experiences in the service.—Am. Drug, 65 (1917), 263 and 443.

Pharmacist.—*Experiences at the Front.*—Although certified as a person having "sufficient skill and knowledge to be registered as a chemist and druggist," the writer found the service to be anything but a dispenser's job. He drilled, route-marched, was made sergeant, the nescorted twenty-one men to point of embarkation. On board the hospital carrier he was soon made dispenser and though he only had a 2-ounce graduate as stock he was able to accomplish much as an aid to the surgeon.—Chem. and Drug., 89 (1917), 3. (M. O'C. D.)

Naval Hospital Corps.—*Training and Duties of.*—G. C. Diekman discusses in detail the duties and the preliminary requirements for members of the Hospital Corps of the Navy. Some of the many duties are nursing, first-aid, assisting the surgeon, care of medical stores, embalming and others. A curriculum of the course of instruction and the chances for advancement are given.—C. U. C. P. Al. J., 24 (1917), 139. (J. H.)

Naval Pharmacist.—*Life of.*—Glen D. Bennett, member of the Navy Hospital Corps, relates some of his experiences, while on the Flagship West Virginia. He also writes of the Hospital Corps as a career and mentions the various duties of the hospital apprentice.—Drug. Circ., 61 (1917), 123. (F. H.)

Metric System.—*Use in Every-Day Life.*—H. V. Arny in a paper presented at the Metric Conference discusses the simplicity of the metric system and urges its adoption with the justifications that:

(a) The development of our foreign trade demands the change.

(b) The saving of time brought about by the use of the metric system would repay the annoyance incidental upon the change.

Typical problems are given for calculating cost of chemicals and drugs according to U. S. units and compared to similar problems based on metric system. The time required and the percentage of correct results obtained from a class of students prove that not only was the percentage of correct problems in the metric system somewhat higher than those done with U. S. units but the time required was also very much in its favor.—J. Am. Pharm. Assoc., 6 (1917), 254. (H. H. S.)

Metric System.—*Relation to Industrial Preparedness.*—J. W. England in a paper read before the Metric Conference suggests that in view of the likelihood of the present war being followed by a trade war the American business man should seriously consider the manufacture of his goods in metric units. He points out that the American people have been using the decimal currency system for the past century and compares the simplicity of the system with the complexity of the British. Approximate units for conversion of one system into the other are given.—J. Am. Pharm. Assoc., 6 (1917), 73. (H. H. S.)

Metric System.—*The Cubic Centimeter vs. the Milliliter.*—Leonard Dobbin states that in the British Pharmacopœia 1898, under the heading, "Weights and measures of the metric system," the milliliter, included as a measure of capacity, is defined as the volume at 4° C. of 1 gramme of water. Under subheading, "Relation of cubic measures to measures of capacity," it is stated that a cubic centimeter equals 0.99984 milliliter and that 1.00016 cubic centimeters equal 1 mil. Distinction is thereby drawn between capacity and cubic measurement. Under another heading the cubic centimeter is considered a measure of capacity. The writer states that the cubic centimeter is not accurately defined and that no distinction is drawn between the true and conventional standards for this term. The term milliliter was defined in this edition but was replaced in the formulæ by the term cubic centimeter. In the B. P. 1914 the term cubic centimeter is entirely replaced by millimeter. The differences between the true and conventional cubic centimeter are almost negligible as in an ordinary volumetric determination the variation would not be more than one or two thousandths cubic centimeter. Attention is directed to the fact that, outside of medical and pharmaceutical practice, the term milliliter is almost entirely replaced by cubic centimeter. The abbreviation "Dl" and "Cl" indicating decimil and centimil, respectively, are criticised as apt to prove misleading more especially as the U. S. P. IX uses these contractions for the terms deciliter and centiliter.—Pharm. J., 98 (1917), 234. (C. W. B.)

Metric System.—*The International Language of Weights and Measures.*—G. F. Kunz has written a paper urging the United States to take the very necessary step of introducing the metric system into this country; and in this way almost compelling Great Britain to do the same. Part of the paper is devoted to a short account of the origin of the metric system. The demand and necessity for its use in this country is strongly emphasized. The author also suggests a means of its adoption among commercial organizations.—Drug. Circ., 61 (1917), 71. (F. H.)

Metric System.—*Advisability of a Metric Teaspoon.*—H. V. Army shows that metric prescriptions have little if any advantage over those in apothecary's quantities in the time saved in calculating doses of liquid remedies. This is because the directions to the patient call for teaspoonful or drop doses.

The fallacy of drop doses is not involved in the present question but rather that of teaspoonful doses. In 1902 the American Pharmaceutical Association adopted a resolution making a teaspoonful equal to 5 mls, a dessertspoonful equal to 2 teaspoonfuls or 10 mls, and a tablespoonful equal to 3 teaspoonfuls or 15 mls. In 1903, the Section on Pharmacy, Materia Medica and Therapeutics of the American Medical Association adopted the same resolution. In spite of this the U. S. P. VIII and U. S. P. IX have given 4 mls as the approximate equivalent of a teaspoonful. Such a standardization is a poor way to induce prescribers to use the metric system. We should try to enforce the 5 mil teaspoonful even as the French and Belgian pharmacopœias have.

The article closes with a report that the measurement of nine teaspoons, the capacity of which ranged from 3.8 to 7.8 mls, and with an appeal to the association's committee on weights and measures to take up the question of a 5 mil, 10 mil and 15 mil medicine glass instead of the glasses now furnished by manufacturers.—J. Am. Pharm. Assoc., 6 (1917), 1056. (Z. M. C.)

HISTORICAL PHARMACY.

Ancient Syrian Medicines.—A number of very amusing formulæ for the preparation of pills, plasters, tablets, wines, and decoctions used by physicians of ancient Syria, are selected from a treatise translated by Dr. Budge of the British Museum. This treatise reviewed at length by J. F. Llewellyn includes among its prescriptions, one directing that, in cases of loss of appetite, the patient was to drink a concoction made from a river crab pounded in cabbage juice. Drug. Circ., 61 (1917), 117. (F. H.)

The Blair Pharmacy.—A paper read before the Historical Section at the Atlantic City meeting under this title gives a short history of this well-known old pharmacy in Philadelphia. The writers, Robert P. Fischelis and H. C. Blair, bring out the fact that this store was the place where a number of now well-known pharmaceuticals, such as elixir of iron, quinine and strychnine, compound syrup of phosphates or "chemical food," etc., originated. A list of 24 rules to govern the conduct of clerks which was originally adopted in 1848, is an interesting addition to the paper. — J. Am. Pharm. Assoc., 6 (1917), 268. (L. S.)

Early Chemical Manufacturing in Philadelphia.—In this interesting historical paper, Dr. Samuel D. Sadtler traces the history of chemical manufacturing in Philadelphia from the times of the colonists down to the latter half of the 19th century.—*Am. J. Pharm.*, 89 (1917), 26. (R. P. F.)

Dublin.—*Early Apothecaries of.*—J. C. McWalter gives under this caption, some interesting facts from the history of these apothecaries, the first of whom is said to have come over with Henry II. In 1484, St. Mary Magdalene Guild, which included barbers, surgeons, apothecaries and periwig-makers, was one of the strongest Guilds in Dublin. By royal charter (1745) the "Worshipful Corporation called Master, Wardens and Commonalty of the Art and Mystery of the Apothecaries of the City of Dublin" minus barbers and periwig-makers, was incorporated. Later (1791), through the efforts of Dr. Lucas, the Irish patriot, the apothecaries established Apothecaries' Hall by an act of the Irish Parliament.

In 1838, Donovan, who with Kiernan, Higgins, and Sir Robert Kane, gave lectures on chemistry at the hall, tried without success to found a college of pharmacy. By the medical acts of 1858 and 1886, the Dublin Apothecaries' Hall ("hall meaning college") is empowered to confer a fully qualified certificate in medicine, surgery, midwifery and pharmacy whereas the medical colleges may only give a partial license since they do not qualify the holder to practice pharmacy.—*Chem. and Drug.*, 89 (1917), 107.

(M. O'C. D.)

Hazard and Hazard.—*The Passing of This Historic Firm.*—An interesting account is written by "The Stroller" of the changes in and around 23rd St. and Broadway during the past half century; the site of The Hazard & Hazard Pharmacy in 1859, now replaced by an extra-modern chain store.—*Drug. Circ.*, 61 (1917), 61.

(F. H.)

"Love Me, Love My Dog."—Under this title, J. U. Lloyd discourses interestingly in the unfortunate fact that personal dislikes between members of organizations and between exponents of different schools of medicine frequently impede the progress of a basic cause to which each opponent is honestly committing. He cites incidents of this that have come under his personal observation.—*Pract. Drug.*, Aug., 1917, 25.

Manchester Pharmacy.—*One Hundred Year of.*—A review, in lecture form, of the development of, and the changes occurring in the pharmaceutical profession in the city of Manchester. Wm. Kirkby, the lecturer, states that in 1826 there existed a society of apothecaries, chemists and druggists in this city. This society may be considered as a prototype of the local associations of this day. This early society promulgated rules for hours of business, retail prices and penalties for violations of the articles of agreement. He traces the changes in the city necessitated by its growth and gives brief accounts of the prominent Manchester pharmacists of the early nineteenth century. In 1841 this local society became the Manchester branch of the Pharmaceutical Society of Great Britain. Chief among the objects of the new organization was the proper education of the pharmaceutical apprentice and in 1842 a course of lectures in pharmaceutical chemistry was arranged for by the branch. This work was of but short duration, for in 1849 the parent association records the collapse of both branch and school. During 1852, in connection with legislation regulating the sale of poisons, the Chemists Conversational Society was formed and in 1853 the Chemists and Druggists Institute. In 1855 these organizations amalgamated and formed the Manchester Pharmaceutical Association.—Phar. Jour., 98 (1917), 315 and 333. (C. W. B.)

Mortar Exhibit.—*Antique Specimens' Shown at the.*—C. A. Mayo gives a description of many of the one hundred mortars—antique and modern—shown at the loan exhibit at the New York College of Pharmacy. The exhibits are grouped as: I, the Italian Renaissance; II, the Flemish or Dutch Renaissance; III, Spanish or Portuguese; IV, English; V, Persian and Assyro-Babylonian; VI, Arabic; VII, Chinese; VIII, Modern Russian; and IX, Miscellaneous. A detailed description and history of many specimens as well as the origin and illustrations thereof are given. A list of exhibitors is also appended.—Am. Drug., 65 (1917), 225 and 271.

(J. H.)

Mortar.—*Antique Arabic Mortar.*—Adelaide Rudolph describes an Arabic mortar shown in the mortar exhibit at the New York College of Pharmacy which has been classified by an antiquarian as: "Saracenic; 12th or 13th century; excavated at Mesopotamia." The specimen was presented to the College.—C. U. C. P. Al. J., 24 (1917), 125. (J. H.)

National Museum.—*Historical Pharmacy at the.*—F. L. Lewton in an address delivered before the Washington Branch of the American Pharmaceutical Association after a discussion on the inception and history of the Museum and its collections describes its objects and results obtained. The Museum fulfils a three-fold function—it is a museum of record, of research and of information.—J. Am. Pharm. Assoc., 6 (1917), 259. (H. H. S.)

New York.—*Reminiscences of Old-Time Pharmacists of.*—T. J. Macmahan speaks of New York's pharmacists from the time he worked as a druggist's apprentice in New York 52 years ago.

The first links of the Hegeman chain in 1864 occupied four stores on Broadway distributed between Cortlandt and Eighth Streets. Among other old timers mentioned are Milhau's establishment at 183 Broadway; Rushton's in the Old Astor House; Fairchild Brothers and Foster, Retailers, at 60 Fulton St., also Meakin's; Hazard & Hazard; Neergard's; Billy Wilson's and Kierstead Pharmacies.

The article is supplemented by an interesting biographical sketch of Mr. Macmahan.—Drug. Circ., 61 (1917), 177. (F. H.)

Pennsylvania.—*Pharmacy in the Fifties.*—J. L. Lemberger recounts some experiences of his apprenticeship days which began about 1850. Apprenticeship then meant being bound by indenture for more than six years. The compensation was board, washing and clothing, and the full privileges of the Philadelphia College of Pharmacy, then the only college of pharmacy in America. Graduating with still two years of apprenticeship to serve, the compensation remained the same.

Mr. Lemberger describes the duties and incidental pleasures in his life and the gradual accretion of knowledge and skill. He contrasts the drug store of then and now; the primitive equipment, in the way of apparatus; the absence of the sandwich counter, the safety razors and the chewing gum; the presence of a unique sideline, that of articulated human skeletons, the assembling and articulation having fallen among the duties of the apprentice; and lastly, the occasional calls for unusual things like the skin of a rattlesnake to be used as a bandage for rheumatism. "Incidents—serious, comic and otherwise"—show the progress that has been made in little more than half a century.—J. Am. Pharm. Assoc., 6 (1917), 717. (Z. M. C.)

Pharmacy in New Jersey.—*Apprenticeship in the Sixties.*—L. E. Sayre discourses interestingly of his drug store experiences of a half a century since and concludes that there was even less real pharmacy in a country store of those days than there is at present. He describes amusingly the vagaries of the then popular Thomsonian system of medicine.—J. Am. Pharm. Assoc., 6 (1917), 454.

Pioneer Drug Store.—*Found in Wisconsin Historical Exhibit.*—An interesting anonymous article describes the drug store that is a part of the exhibition of the Wisconsin Library Museum. The store is a combination of relics, including fixtures, show windows, containers and apparatus, contributed by a number of druggists of the State, through the efforts of the committee on historical pharmacy of the Wisconsin association. Some of the articles date back to 1837, when the first stock of drugs was added to that of a general store located at Green Bay.—Pharm. Era, 50 (1917), 45.

Reminiscences.—A historical paper by Thos. D. McElhenie which deals with pharmacy beginning with 1865.—J. Am. Pharm. Assoc., 6 (1917), 276. (L. S.)

Walter Scott.—*The Pharmacy and Medicine of.*—Those interested in tracing the history of pharmacy will find much pleasure in reading the article under the above title as read before the Section on Historical Pharmacy at the Atlantic City meeting. The writer, Arthur W. Linton, quotes many paragraphs from the Waverly novels showing that Sir Walter Scott had a fairly intimate knowledge of medicine and pharmacy as practiced at that time.—J. Am. Pharm. Assoc., 6 (1917), 158. (L. S.)

Shakespeare's Garden.—An article from the "Perfumery and Essential Oil Record" in which a few of the numerous allusions to flowers and perfumes occurring in Shakespeare's plays are quoted and commented upon.—Am. Drug., 65 (1917), 55. (C. W. B.)

Some Exponents of American Pharmacy.—Under this title, J. F. Patton describes his impressions of Squibb, Rice and Maisch as his associates at meetings of the American Pharmaceutical Association.—J. Am. Pharm. Assoc., 6 (1917), 461.

Superstition in Medicine.—L. Irwell discusses the use of music by the ancients for curing disease; the supposed influence of precious stones on health; the imagined medical potency of the king's touch; the use of red flannel as a medicament; and the former vogue of love philtres.—*Pract. Drug.*, May, 1917, 29.

Wisconsin. *Old-Time Apothecary in.*—E. B. Heimstreet discusses interestingly Wisconsin pharmacy of forty years ago, throwing light on the beginnings of the Wisconsin association and Board of Pharmacy.—*Drug. Circ.*, 61 (1917), 5. (F. H.)

WOMEN IN PHARMACY.

Pharmacy.—*A Desirable Profession for Women.*—Under this title Mrs. Hampton Ray Kenaston read a paper before the Women's Section at the Atlantic City meeting. The writer reviews one by one the various characteristics of human nature necessary to the practicing of the profession of pharmacy and brings out the fact that woman possesses them to a remarkable degree.—*J. Am. Pharm. Assoc.*, 6 (1917), 177. (L. S.)

GEOGRAPHIC PHARMACY.

British Pharmacy.—*War-Time Conditions.*—A review on the changes as to wages, the large percentage of unemployed and the pharmacists' difficulties in conducting business during war times. The author also mentions the fact that in numberless cases girls are doing the work of the boys.

The following is a list of special war wants: Ointments, powders, lotions, belts, shirts, etc., compact medicine pocket-cases and electric pocket-lamps. In concluding, "Ajax" devotes a paragraph on how British pharmacists have helped their country.—*Drug. Circ.*, 61 (1917), 7. (F. H.)

Hindu Pharmacy.—At the meeting of the Minnesota Pharmaceutical Association, V. R. Kokatnur discussed the practice of pharmacy in India, pointing out that the Vedas, which has been placed between B. C. 10,000 and B. C. 3,000, records the medical science of the day. Modern pharmacy in India is essentially the same as that of ancient times and consists largely of the administration of crude drugs. The writer points out that there is not a single school of pharmacy in India and that there is a great chance for

American schools to train young Hindus.—*Pract. Drug.*, June, 1917, 22.

Russia.—*Pharmacists' Assistants in.*—Pharmacists' assistants in Petrograd had a much better position in 1917 than prior to the revolution. During the old régime, it was a privilege for a Hebrew to be an assistant pharmacist, receiving a very small salary. Under military régime their position was even lower, for they had to serve in the ranks, whereas Russian druggists were allowed to serve as military pharmacists. With the revolution came freedom and equality; the right to hold meetings, form unions, print circulars. A natural direct result was that assistant pharmacists demanded increased salaries; after a crisis of three days with a strike impending and the city authorities threatening to open municipal pharmacies, the masters gave in, thus causing a betterment of the position of the pharmacist.—*Chem. and Drug.*; through *Am. Drug.*, 65 (1917), 495. (M. O'C. D.)

Swiss Drug Store.—*As Seen in the Central West.*—F. J. Koch describes the quaint, cleanly and business-like Swiss apothecary shop in Cincinnati with all the sparkle created by the atmosphere of such a delightfully unique drug store.—*Drug. Circ.*, 61 (1917), 128. (F. H.)

COMMERCIAL PHARMACY.

Accounting.—*Importance of Cost.*—J. R. Worden in a paper read before the Detroit Branch describes the importance of cost accounting in the drug store. He discusses in detail just what the bookkeeping should tell the storekeeper and what use the latter should make of this knowledge. Finally the question of training help is discussed.—*J. Am. Pharm. Assoc.*, 6 (1917), 535.

(H. H. S.)

Accounting.—*Simplified System for the Drug Store.*—E. F. Cook explains a simplified method of bookkeeping for the retail druggist which, although requiring only little time and labor, still places his business upon a scientific and definite profit-making basis.—*Proc. N. J. Pharm. Assoc.*, 47 (1917), 53. (J. H.)

Advertising.—*Novel Method for a Drug Store.*—At the meeting of the Commercial Section of the American Pharmaceutical Asso-

ciation, F. M. Apple describes the advertising value he found in promoting an amateur ball team bearing his name.—J. Am. Pharm. Assoc., 6 (1917), 386.

Advertising.—*Scientific Pharmacy as Aid to.*—It is universally conceded that the value of advertising has long been established as a much-demonstrated fact. The average pharmacist undoubtedly appreciated this and makes use of printer's ink to make himself known to his neighbors, both laymen and medical men. Jacob Diner concedes as much but brings out the point that the druggist goes about it in the wrong manner; that the pharmacist oftentimes goes out of his way to advertise his neighboring pharmacist when his sole consideration should be to make himself known and commend himself to the public; the author then goes on to show how the pharmacist should at all times impress on the public the fact that he is a real pharmacist and possessed of the requisite scientific pharmaceutical knowledge to serve the public at all times. If this sort of thing is persistently pressed home to the public and especially to the medical fraternity the pharmacist is bound to reap a harvest.—Pract. Drug., April, 1917, 24. (J. K. T.)

Advertising.—*Street Car.*—H. W. Wensch, Jr., states his belief based upon two years of personal experience that street car advertising is a poor investment.—Proc. N. J. Pharm. Assoc., 47 (1917), 175. (J. H.)

Advertising.—*Various Phases of.*—H. S. Noel discusses the advertising value resulting from publicity of the right sort. He recognizes the necessity for executive and managerial ability on the part of the proprietor and of sufficient and efficient help. Given these, a definite system should be adopted. A druggist must never be content with the existing order and he must not fear to venture.

Personality is an advertising asset. Having the thing the customer wants or showing a desire to get it is good publicity. Tact on the part of salespeople, their appearance as well as that of the store, wholehearted service, in attitude and in action, are essentials in the right publicity. Well-chosen window displays bring good returns. A man's name may be made to acquire such a prestige that it will bring in large sums. A good slogan used with the proprietor's name grows in value with usage.

Education of customers to understand the disadvantages of doing business with mail order houses is an absolutely necessary feature of advertising if one has that sort of competition to meet.

Salesmanship with all that it means, knowledge of goods by no means the least consideration, is an important element in a successful retail business.

Patience is necessary; results from advertising do not come like those "that followed the rubbing of Aladdin's lamp." Above all there must be business integrity, old-fashioned honesty.—J. Am. Pharm. Assoc., 6 (1917), 961. (Z. M. C.)

Business End of Pharmacy.—*What Is Wrong with the.*—Jacob Diner attempts to answer this question in a paper read before the Section on Commercial Interests at the Atlantic City meeting.—J. Am. Pharm. Assoc., 6 (1917), 152. (L. S.)

Business Man.—*The Pharmacist as a.*—H. E. Bischoff discusses the value of business ability from the standpoint of the successful pharmacist, laying particular stress upon such points as inventory, overhead, bills collectable, debts, per cent. profit, etc. The author states that pharmacists can learn much of value to them by affiliation with commercial organizations. He strongly urges active participation in all possible civic and social activities.—Proc. N. J. Pharm. Assoc., 47 (1917), 50. (J. H.)

Facing the Facts.—"Does the present status of pharmacy represent evolution or devolution? Whether for good or ill, the modern practice of pharmacy has altered from a semi-professional occupation to one which is predominantly commercial," states J. H. Beal, defending the place and purpose of the commercial rather than the so-called "professional pharmacy." Such a change, no doubt, is the resultant of divers factors—the increased complexity in the manufacturing processes and the increased refinement in methods of testing; the introduction and general use by both physicians and laity of new classes of medicinal products, such as the coal-tar or synthetic compounds, sera and vaccines which can be prepared only in large establishments. Added to these facts are the equally prominent ones of the physicians steadily doing more and more of their own dispensing and the tendency of advanced medical schools to abolish materia medica from their currie-

ula. Thus the pharmacist to keep his doors open on the busy thoroughfare must sell cigars, sodas, cameras and photo supplies and general proprietary articles.—*Am. Drug.*, 65 (1917), 489. (M. O'C. D.)

Net Profits and the Average Sale.—C. L. Eddy emphasizes the danger a druggist is in if he forgets that gross profit which is based on cost is a much larger figure than if calculated on selling price. If he figures gross profit on cost, and overhead expenses on sales, he is heading toward certain disaster. It is not such a difficult matter to convert the percentage of gross profit on cost into percentage of selling price, or *vice versa*, and it is absolutely essential to sound business to figure both profit and cost of doing business on the same thing.

If it seems to be necessary to sell some articles so low that there is no profit or even a loss then the counter-balancing feature must be the selling to the same customer another item that yields a good net profit. Mr. Eddy demonstrates graphically how in this way an unprofitable sale may be turned into a profitable one.

Too often a druggist does not know the amount of his average sale or that 35 cents is the average for the United States and that 25 cents is the lowest safe figure.

To increase the amount of the average sale, "sell largest sizes, talk quality, suggest 'running mates,' sell additional items, improve advertising and display methods, perfect store service." This brings up the question of salesmanship and Mr. Eddy gives a few rules applicable in any store.

Finally, he sums up by stating some undeniable facts, such as increasing the average sale, so that the figure should be well above 40 cents.—*J. Am. Pharm. Assoc.*, 6 (1917), 815. (Z. M. C.)

Photographic Supplies.—*A Side-Line for Pharmacy.*—In a paper under this title, Emil Roller goes into the various reasons why this side-line properly belongs to the pharmacist and how it can be made a source of profit.—*Proc. Am. Pharm. Assoc.*, 6 (1917), 64. (L. S.)

Prescription Prices.—R. H. French gives tabulated results of his investigation based upon the compounding of 800 prescriptions in 8 stores and figures therefrom that the average compensation for the pharmacists' skill and labor and time is only \$2.03 per

hour, which he claims is entirely too low.—Proc. N. J. Pharm. Assoc., 47 (1917), 59. (J. H.)

Prescription Prices.—L. Stolz pleads for more care in the pricing of prescriptions. He gives four typical prescriptions which are usually compounded at prices which mean loss to the dispenser. He believes that the doctor and the patient wish accuracy in compounding rather than cheapness of price.—Proc. N. Y. S. Pharm. Assoc., 39 (1917), 217.

Prescription Prices.—In a paper read before the House of Delegates at the Atlantic City meeting H. B. Mason brought out in fact that there is abundant necessity for greater uniformity the prescription pricing. After analyzing numerous systems used by well-known pharmacists throughout the country he recommends the adoption of the Evans rule. The rule has simplicity to commend it and is very easy to apply. The rule is merely this: Get a profit approximating 100 per cent. on the cost of the base material and container, and then charge a dollar an hour for the actual time consumed in compounding.—J. Am. Pharm. Assoc., 6 (1917), 281. (L. S.)

Prescription Prices.—The price of a prescription should be calculated as follows: Cost of ingredients, plus overhead expense, plus time cost, plus the price of the container, plus professional remuneration. So says Hugh Craig in a paper read before the House of Delegates at the Atlantic City meeting. The writer also goes into the method of calculating the various items of expense as they enter into prescription compounding.—J. Am. Pharm. Assoc., 6 (1917), 285. (L. S.)

Prescription Prices.—The following formula for pricing a prescription is furnished by F. W. Nitardy after carefully considering the numerous factors which necessarily enter into its compounding and delivery. The writer also furnishes a tabulated statement on the actual cost and selling price of 1000 prescriptions in both 1915 and 1916.

Cost.....	\$0.385	50 per cent.
Expense of doing business.....	0.227	30 per cent.
Service fee.....	0.079	10 per cent.
Net profit.....	0.079	10 per cent.
<hr/>		<hr/>
Total.....	\$0.770	100 per cent.

This would represent a fair retail price for a prescription costing $38\frac{1}{2}$ cents, and one that could readily be obtained by all pharmacists for the asking. It would stand public investigation and criticism, for on this basis the average prescription would bring 75 to 80 cents, which would mean a combined net profit and professional fee of 15 to 16 cents to which no fair-minded person would object.—J. Am. Pharm. Assoc., 6 (1917), 287. (L. S.)

Prescription Prices.—*Fair and Unfair.*—At the Atlantic City meeting of the American Pharmaceutical Association, R. P. Fischelis read a paper, deploring the apparent lack of knowledge on the part of certain druggists of the price of the medicaments they dispense in prescriptions. He cites two veterinary prescriptions, which, calculated by the N. A. R. D. schedule, should have been dispensed for \$3.45 costing the customer \$4.25 and when complaint was made, the druggist changed the price of the two to \$1.65.

In the discussion that followed, many factors entering into the price of prescriptions, type of customers, large or small rent of store, light or heavy overhead, were brought out.—J. Am. Pharm. Assoc., 6 (1917), 373.

Profits.—*More within Reach.*—W. W. Figgis discusses this subject under five heads.

First: "Is the commercial spirit too prominent in the drug store?" The prescription and manufacturing department is the "barometer" of a drug store. He who realizes this aright builds his business on the community's confidence, which is a better foundation than mere price. There are innumerable touches that add prestige: for instance, the graduated medicine glass, distinctive prescription bottles and corks, "Put up by—Checked by" stickers.

Second: "Should the purchasing of goods be confined to firms of unquestionable reputation?" When price only controls buying the result is disastrous and the buyer learns "by bitter experience that it is possible to hold a penny so close to the eye that a ten dollar bill cannot be seen a foot away." The effect of selling dependable goods is cumulative.

Third: "Has the average drug clerk been given sufficient technical information about the merchandise he is endeavoring to sell?" Mr. Figgis illustrates the *efficiency* or *deficiency* of a clerk's knowledge by citing the difficulty that may arise from the

choice of an atomizer for a prescription whose basis is petrolatum and which is to be sprayed down the throat.

The fourth query deals with the sale of "own make" specialties and the fifth with the psychology of salesmanship.—J. Am. Pharm. Assoc., 6 (1917), 1068. (Z. M. C.)

Responsibility.—*Capitalizing.*—J. C. Peacock points out that while responsibility is a large part of pharmaceutical service, it has been neglected as a source of revenue, even to giving it for nothing. Any business involving risk must be protected against risk. Why not pharmacy?

He points out the many phases of responsibility coming in the daily routine of the drug store, from the lives of the patients for whom prescriptions are compounded to the legal responsibilities such as grow out of present-day narcotic laws. For all such responsibilities a suitable fee should be charged.—J. Am. Pharm. Assoc., 6 (1917), 897. (Z. M. C.)

Salesmanship.—G. M. Levan, of Pennsylvania, mentions some qualities that he maintains are absolutely essential for selling goods. He lays particular stress on "Courtesy," "Cheerfulness," "Patience," and knowledge of what one is selling. Courtesy is fundamental, he says; people will not deal with a person they do not like. It is bad policy to force a sale. A dissatisfied customer is a poor advertisement.—Proc. Penna. Pharm. Assoc., 40 (1917), 243. (J. K. T.)

Salesmanship.—*Fallacies in Popular Psychology of.*—Phrenology though discredited by scientific people has according to C. O. Lee been "one of the most persistent fallacies of vocational analysis." Believers in physiognomy also overestimated the significance of facial character and expression in proving mental and moral character. Both classes made many generalizations without psychological basis.

Certain well-established scientific facts prove the unsoundness of both phrenology and physiognomy. In spite of these fallacies there is a real sound psychology, knowledge of which is helpful to one who would be a successful salesman. In unscientific language it demands courtesy, tact, judgment, and ability to meet a customer on a common level.—J. Am. Pharm. Assoc., 6 (1917), 810. (Z. M. C.)

Side-Lines.—In a paper read before the Commercial Section of The American Pharmaceutical Association, A. S. Coody deprecates the extension of side-lines in the drug store. He feels that the soda fountain, surgical supplies, perfumes and toilet articles and cigars are the only side-lines that can be considered as properly belonging to pharmacy and he believes that if the pharmacist devoted as much time to the professional side of his calling as he does to side-lines he would make as much, if not more, money.—J. Am. Pharm Assoc., 6 (1917), 383.

Substitution.—*Importance as a War Time Measure.*—O. Raubenheimer cites many instances where substitution and the search for substitutes for expensive substances has led to many important chemical discoveries. Among these may be mentioned the very valuable compilation of the principal foreign mineral springs together with their equivalent in this country, by Prof. Felix von Oefele. The use of sodium for potassium salts is recommended by the present Pharmacopœia for a number of preparations. The statement in German Pharmacopœia that "Tinctura Ipecacuanhæ shall be dispensed when Vinum Ipecacuanhæ is ordered," is nothing but an authorized substitution. The British Pharmacopœia also contains a great number of notes at the end of monographs sanctioning the substitution of similar drugs when prescribed in different parts of the British Empire. The paper closes with the suggestion that the pharmacist use his knowledge to inform physicians of the use similar (or "parallel") drugs to replace those that are now scarcely obtainable.—J. Am. Pharm. Assoc., 6 (1917), 50.

Substitutes.—H. Engelhardt tabulates and describes the various substitute preparations ("Erzatz-Präparate") now being used in Germany in place of fats, oils and glycerin. The article deals particularly in the use of the substitutes as vehicles in pharmaceutical preparations.—J. Am. Pharm. Assoc., 6 (1917), 56. (H. H. S.)

System.—*Importance in the Drug Business.*—Louis Schulze reiterates the numerous reasons why system must be followed in order to successively conduct any kind of a business. His article is illustrated by the relation of a true story of the failure of a particular drug store which was finally placed in the writer's hands for disposal.—J. Am. Pharm. Assoc., 6 (1917), 62. (L. S.)

The Original Package.—In using this title, L. E. Sayre refers to "the pharmaceutical package in carton, wrapper, more or less artistically designed, accompanied with magic advertisement to promote sale." He believes these preparations are increasing and, thereby, decreasing the practice of legitimate pharmacy and indirectly reducing the writing of prescriptions. It is impossible to make a package remedy to fit every possible combination of ailments. Their use interferes with the U. S. P. and the N. F. propaganda. Above all, the contents of these packages deteriorate and much of the package medicine fails to meet the requirements.

The pharmacist must become sufficiently expert to be his own inspector, he must be an authority on the things he dispenses or "be relegated to the lower ranks of merchant bartering in package medicines, the knowledge of the contents of which he has as little knowledge as the dealer who sells canned goods."—J. Am. Pharm. Assoc., 6 (1917), 958. (Z. M. C.)

DISPENSING PHARMACY.

Emmenagogues and Venereal Remedies.—*Druggist's Duty concerning.*—C. F. Huhn in a paper read before the Detroit Branch deplores the promiscuous dispensing of such drugs and gives a number of specific instances illustrating the harm caused by the self-administration of emmenagogues and of drugs for venereal diseases.—J. Am. Pharm. Assoc., 6 (1917), 532. (H. H. S.)

Notes on Dispensing.—A. Schleimer in an interesting manner discusses a number of prescriptions compounded by him, in which a nicety of manipulation meant the difference between an attractive and an unsightly preparation. The paper should be read in its entirety.—Merck's Rep., 26 (1917), 128.

Pharmacy.—*Elevation of.*—Philip Ellovich says that if pharmacy is to be a profession the taint of financial superiority must be removed. He feels that the pharmacist should have high and lofty ideals and be of the intellectual type; for those of the profession who do not measure up to this type he lays down a plan of procedure by which he thinks they may attain such education as they failed to acquire before taking up the study of their profession. He advises the publication of a syllabus setting forth books that the

pharmacist should read, these books affording what he calls an education in literature and arts.—Proc. Penna. Pharm. Assoc., 40 (1917), 144. (J. K. T.)

Pharmacy.—*Physicians' Support of.*—In an address before the joint meeting of the Medical Society of New York County and The New York Branch of the American Pharmaceutical Association, W. A. Bastedo emphasizes the fact that pharmacists are now better educated than ever before, and that good pharmacists are doing much to improve the conditions of the practice of pharmacy.—Drug Circ., 61 (1917), 186. (F. H.)

Pharmacy.—*The Present Status of Professional.*—In a paper read at a joint meeting of the Medical Society of New York County and the New York Branch of the American Pharmaceutical Association, George C. Diekman divided pharmacies into three classes: First, the purely professional pharmacy; second, the pharmacy which attempts to co-ordinate its various branches and departments; third, the pharmacy in which drug and prescription department, plays an altogether subordinate part. Dr. Diekman also enters upon a description of the three types of pharmacies alluded to.—Drug. Circ., 61 (1917), 186. (F. H.)

Pharmacy.—*Relation to Medicine.*—Dr. George D. Wolf, in an address to the Associated Pharmacists and Drug Clerks of Greater New York, gives his impressions of pharmacy as practiced when he was actively engaged in it and as he now finds it. Pharmacy has undergone marked changes, and in his opinion, these changes are not at all creditable to pharmacy. The growing tendency of the pharmacist to become more and more a commercial man, depending altogether on the manufacturer for pharmaceutical products and the like tendency of the physician to disregard the prescribing of official drugs and preparations and be brought under the evil influence of the energetic detail man, has caused a drifting apart of the two callings. Dr. Wolf states that in spite of the pharmacist's added commercial activities, his income has not increased. He warmly advocates that the standard for obtaining the Ph.G. degree be raised by demanding greater preliminary education for admission to reputable colleges of pharmacy and that the course of instruction in pharmacy be raised from two to three years. He also advises that pharmaceutical associations

send out detail men to impress physicians with the desirability of prescribing the preparations contained in the United States Pharmacopœia and the National Formulary. And he also recommends that there be established in the colleges of pharmacy post-graduate courses, so that ambitious pharmacists would have available at all times the opportunity of receiving systematic instruction in the advances in medicine and pharmacy.—*Drug. Circ.*, 61 (1917), 130. (J. K. T.)

Prescription Department.—*Development of.*—E. F. Cook states his belief that a well-equipped prescription department, for which he briefly mentions specifications, will potentially increase the pharmacist's professional standing as well as his profits.—*Proc. N. J. Pharm. Assoc.*, 47 (1917), 62. (J. H.)

Prescription.—*An Interesting.*—L. F. Kebler reports that a prescription containing mercuric chloride $\frac{1}{2}$ grain, precipitated sulphur 2 drachms, and sufficient cacao butter to make thirty pills produced serious illness in the case of the patient for whom it was prepared. This prescription was examined from the standpoint of the variability of the weight of the pills, the chemical reactions, involved uniformity of distribution of the ingredients, and method of analysis. The result of the examination showed that the prescription had been properly filled, and that practically no chemical reaction took place in the mixture. The method of analysis is outlined and it is observed that if this mixture were given to a chemist, without any knowledge on his part of the presence of mercuric chloride, he would probably overlook it.—*Am. J. Pharm.*, 89 (1917), 251. (R. P. F.)

Prescriptions.—*Filing by Name.*—Joseph Hart's knowledge of human nature assisted by the personal element of calling a customer by name in a courteous manner has brought him an exceptional prescription business. People in general hate to be called by number: upon receipt of the prescription, Mr. Hart gets the name and address of the customer to write the same by typewriter on the prescription. This makes a record of two-fold importance, first for himself for refilling in case the number is lost and also for the physician who often fails to get the correct name and address of the patient. The common custom of checks is troublesome since most druggists have the same colored checks: women get

these mixed with other memoranda, men tear them or roll them up to throw away. Where several members of a family are having prescriptions at one and the same time this method often saves serious after-consequences by the knowledge of whether the prescription is for child or adult. This is especially true where the prescription contains potent ingredients; here is a chance to eliminate giving an infant a liquid intended for an adult. Physicians will appreciate this detail work and will be favorably impressed.—*Pacif. Pharm.*; through *Am. Drug.*, 65 (1917), 495. (M. O'C. D.)

Prescriptions.—(*Quick Filling of Certain Types.*)—I. J. Blumenkrantz recommends that in compounding prescriptions calling for pills containing phosphorus the other ingredients be massed and the phosphorus be added to each pill in the form of a ready-made coated pill of the appropriate strength. He advises a similar procedure when odorous drugs such as valerates, or staining drugs, such as methylene blue, are called for.—*Proc. N. Y. S. Pharm. Assoc.*, 39 (1917), 240.

Testing Official Drugs.—(*Necessity of.*)—G. C. Diekman points out that with the ninth revision of the United States Pharmacopœia the duties and responsibilities of the conscientious pharmacist have been materially increased. In conjunction with numerous additions, new standards and new methods for determining such standards have been introduced and old ones have been defined more clearly. All this has been done with the view of encouraging the retail pharmacist to subject official articles that he purchases to a more or less critical examination. Dr. Diekman says that hitherto the retail pharmacist has taken too much for granted in the quality and purity of the drugs purchased by him. He mentions quite a few drugs and chemicals that he examined with results that prove that there is a real necessity in the pharmacist being alert at all times in this regard. Many, if not all, of the drugs and chemicals handled by the retail pharmacist show the need of careful examination and testing, and in the Pharmacopœia he possesses every facility for assuring this protection to his medical clientele and customers.—*Drug. Circ.*, 61 (1917), 129. (J. K. T.)

Time Savers.—D. M. Fletcher describes gummed price tags used by him for affixing on containers, during these days of constantly

shifting drug values. He also describes a card employed on containers in the stock room, on which purchasing and dispensing data can be written; the card being returned to the office, when the container is empty.—J. Am. Pharm. Assoc., 6 (1917), 452.

U. S. P. and N. F. Preparations.—*Prescribing of.*—At a banquet of the Kings County Pharmaceutical Society, J. L. Lascoff spoke on the above subject, emphasizing to the physicians present the desirability of prescribing official preparations instead of proprietary remedies. He commented on the improvement made in many of the official preparations during the last revision of the Pharmacopœia and Formulary and exhibited samples of the various flavoring and coloring agents now recognized by the two standard works.—D.-A. Apoth. Ztg., 38 (1917), 35.

U. S. P. and N. F. Preparations.—*Need of Greater Interest in.*—Z. W. Rike presents arguments in favor of the preparations made by the pharmacist according to the U. S. P. and N. F. as opposed to the products put out by manufacturers of pharmaceutical products. The writer also gives his views as to how these preparations should be popularized to the physician.—J. Am. Pharm. Assoc., 6 (1917), 155. (L. S.)

War Pharmacy.—C. P. Wimmer describes the conditions facing European pharmacists. Many "substitutes" that have from necessity been legalized by foreign governments as well as the formulæ for some new galenicals brought forth by the unusual conditions are given. These include ointment bases and substitutes for glycerin and for soap.—Proc. N. J. Pharm. Assoc., 47 (1917), 44. (J. H.)

MISCELLANEOUS.

Botanical Magazine.—*New.*—A new botanical magazine, entitled "Heil und Gewürzpflanzen," published in Munich, is devoted to the promotion of medicinal and other plant culture.—Chem. and Drug., 89 (1917), No. 1979, Supp. XXXVI. (K. S. B.)

Chemical Society.—*Organization.*—A new Society of Chemical Industry has been formed in Paris to establish permanent contact

between science and manufacture by means of lectures, congress, competition, exhibitions and a periodical publication.—*Chem. and Drug.*, 89 (1917), 753. (K. S. B.)

Hospital Pharmacy.—*Social Service Aspects of.*—Miss Bertha Ott calls attention to the very large field of opportunity for service to humanity in this branch of hospital work which recognizes that the cause of disease is often due to conditions in which people live. Hospitals have learned that their duty is not at an end when patients are well enough to be discharged and are making provisions for following them up and helping to remove the wrong conditions and teaching them how to live to prevent recurrence of disease.

Communities are coming to realize that "health is not the property of the individual who enjoys it, but of the community; disease menaces not only the sufferer but all with whom he may come in contact."—*J. Am. Pharm. Assoc.*, 6 (1917), 820. (Z. M. C.)

Library.—*Pharmaceutical Society of Great Britain.*—An address by the Librarian, J. W. Knapman, dealing with the history of this library. It was established in 1842 merely as a writing room, books being but a secondary consideration. From this small beginning it has grown until in 1911 the catalogue listed over 14,000 volumes. The library specializes on pharmacy and materia medica but reference volumes of the allied sciences are well represented. One of the most important acquisitions was the Daniel Hanbury Library. An American system of classification and indexing is employed. Four illustrations of title pages accompany the article.—*Pharm. J.*, 98 (1917), 436. (C. W. B.)

Napoleonic War Era.—*Men of Science of.*—This contribution by Gordon Sharp deals with the versatility of the scientific men of this period and includes short biographies of several French scientists living at the time. The friendly relations among scientists of warring nations during the early part of the last century is a striking contrast with conditions prevalent in these days of world war.—*Pharm. J.*, 98 (1917), 451. (C. W. B.)

Pharmaceutical Press.—*Influence on the Retail Drug Trade.*—H. Kantrowitz, after explaining the great influence, for good or

evil, wielded by the press, tells how the pharmaceutical press serves the retail druggist in keeping him posted as to advances made in science and in trade.—*Pract. Drug.*, June (1917), 26.

The Handy Black Volume.—H. V. Army briefly describes the volume of the Year Book of the American Pharmaceutical Association both from the standpoint of the scientist and of the practical retail pharmacist.—*Proc. N. J. Pharm. Assoc.*, 47 (1917), 70. (J. H.)

The Pharmacist in Literature.—R. Cecil Owen, after alluding to Mr. Stephenson's article on the pharmacy of O. Henry, expresses regret that the pharmacist has figured so seldom in literature. He explains this by the fact that pharmacy is so full of technicalities that the novelist, to write well about pharmacy, must either be a pharmacist himself or call to his aid a pharmacist. He then discusses George Gissing's story, "Fate and 'The Apothecary,'" pointing out that Gissing's skill in depicting pharmacy evidently came from the fact that his father was a pharmacist. He discusses unfavorably the pharmacy of De Vere Stacpoole's "The Doctor;" Conan Doyle's "The Croxley Master," with its gratuitous "slam" at the pharmacist; but highly praises Wedmore's "A Chemist in the Suburbs."—*Pharm. J.*, 99 (1917), 109 and 120.

The Pharmacist in Literature.—*An Illustration in a 17th Century Journal.*—In the eighth of his series of papers on the apothecary in literature, E. Kremers describes a cartoon published in the early part of the seventeenth century. The cartoon concerns the union of protestant princes in 1608 and in one portion is seen the apothecary in his shop preparing medicine in a mortar. A reproduction of the cartoon is given in the article.—*D.-A. Apoth. Ztg.*, 38 (1917), 115.

The Pharmacist in Literature.—*As Described by O. Henry.*—Although this writer had but short experience as a druggist, Thomas Stephenson points out that many of his stories show a considerable and intimate knowledge of pharmacy. Instances where his writings are tinged with pharmaceutical atmosphere will be found in "A Ramble in Aphasia," "The Love Philtre of Ikey Schoenstein" and "The Gentle Grafter."—*Pharm. J.*, 98 (1917), 293. (C. W. B.)

The Pharmacist in Literature.—*As Described by Flaubert.*—R. Cecil Owen refers to one of the greatest French novelists of the 19th century, Flaubert.

He quotes a passage from Flaubert's "Madame Bovary," in which M. Homais, a first-class pharmacist, plays a conspicuous part in the novel.—Pharm. J., 99 (1917), 132. (F. H.)

The Pharmacist in Literature.—*As Described by Chesterton.*—R. Cecil Owen points out that in a novel entitled "Napoleon of Notting Hall," Mr. Chesterton speaks of pharmacy in a most whimsical but interesting manner.—Pharm. J., 99 (1917), 133. (F. H.)

Our Association and Its Doings.—At a meeting of the Bronx County Association, M. Soskin discussed the need of betterment in the pharmacist's economic condition and his professional status, as well as in the social relation between physician and pharmacist. He describes how the activities of the association have been directed toward assisting the members in obtaining the very necessary knowledge of merchandising they usually lack. The evils resulting from price-cutting, substitution and counter-prescribing are discussed. The author believes that the economic conditions as they exist to-day are the real source of most of the pharmacist's troubles.—Drug. Circ., 61 (1917), 240. (J. H.)

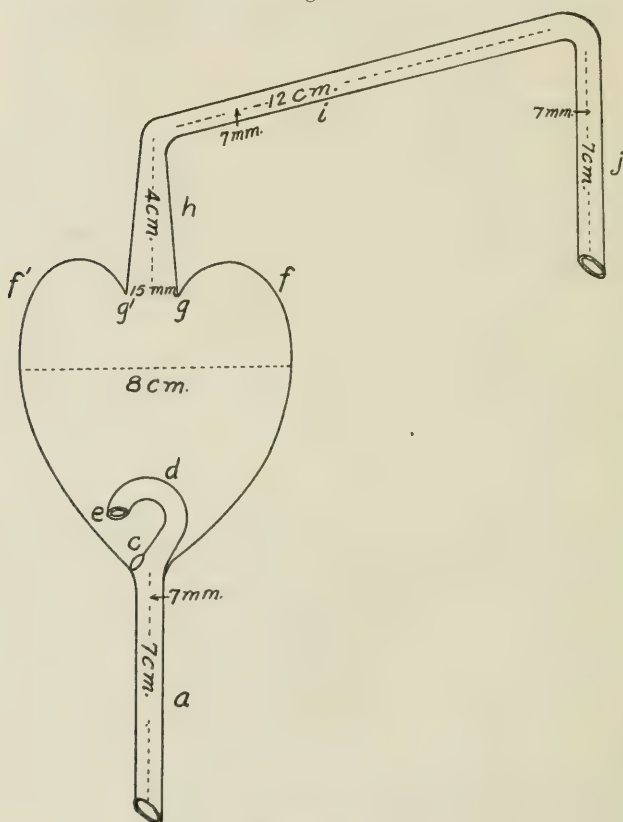
With the Palestine Army.—H. E. Chapman gives a vivid picture of the Holy Land and its position in the present war. As an ordinary pharmacist he did not dream that the war would bring him as a field dispenser of an ambulance unit into the land of romance and adventure passing successively through Gallipoli, Sinai, the west desert of Egypt and finally landing in Gaza, a historic theatre of war. He tells of the realities of war when he describes a morning salutation of a long-range gun fire upon his allotted area; of the attack upon and the aerial activities over Gaza. In addition he gives a fineword picture of the animal life, the customs of the natives, the old and new methods of transportation and the conditions of living of the country. Castor oil, bismuth and aspirin are the drugs greatest in demand; these he dispenses from a square hole dug in the ground having ledges cut out of the sides for shelves. Iodine ampuls are used in the fields for slight wounds and permanganate fomentations are successfully used for the treatment of the

stings of the large black scorpions.—Pharm. J., 99 (1917), 244. (M. O'C. D.)

B—APPARATUS AND MANIPULATIONS

Distilling Head.—*New Forms of.*—The illustration given below (Fig. 1) shows a form of distilling head devised by O. Stearns,

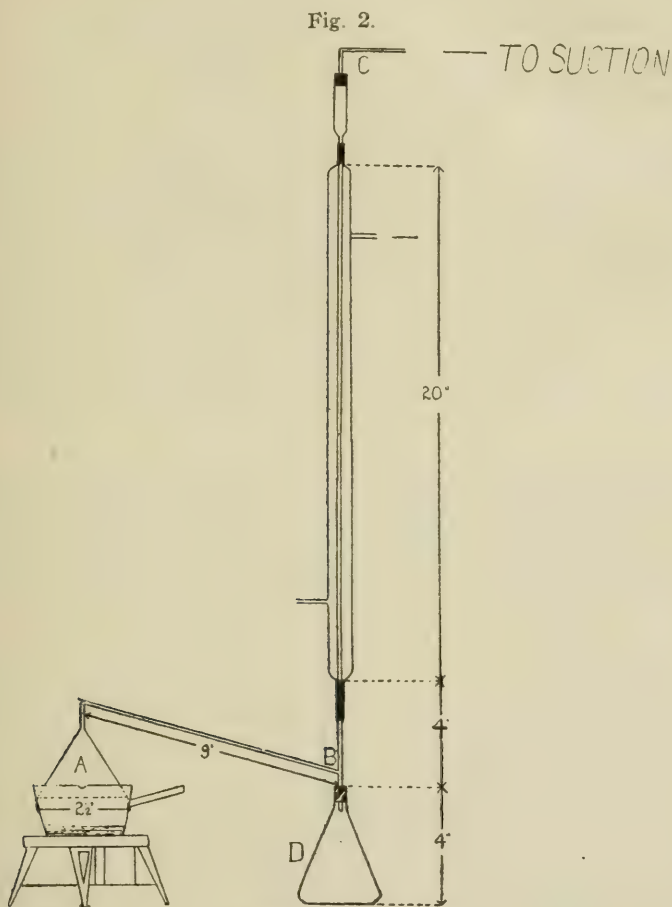
Fig. 1.



Distilling Head.

who has found it particularly useful in distilling frothing fluid-extracts. The angle between *h* and *i* should be 110° .—J. Ind. Eng. Chem., 9 (1917), 972.

Distilling Apparatus.—*For Recovery of Organic Solvents.*—H. F. Lewis describes the apparatus illustrated herewith (Fig. 2). It consists of a bent $2\frac{1}{2}$ inch funnel (A), the stem of which is connected to the inner tube of a water condenser (B). To the lower end of the condenser tube is fitted by means of a cork a receiving flask (D), while the upper end of the tube (C) is connected with



Distillation Apparatus.

a water suction pump. The material to be evaporated is placed in an evaporating dish, beaker or crucible, is then placed under the inverted funnel and on the application of suction the vapor

from volatile liquid passes up through the funnel into the condenser, where it liquefies and collects in the flask.—J. Am. Pharm. Assoc., 6 (1917), 27.

Graphite Crucibles.—*Increasing the Life of.*—To increase the length of service of graphite crucibles the German manufacturers are coating the interior with a paste made by grinding old graphite crucibles with water.—Chem. and Drug., 89 (1917), No. 1968, Supp. XL. (K. S. B.)

Infusion Mug.—*New Type.*—Antonio Izidro Gonsalves has applied for a U. S. patent on an appliance for preparing infusions. His device consists of 2 cups fitting one within the other, the outer one being provided with a handle and the inner one with numerous perforations. At the bottom of the outer cup the matter to be infused is placed. Then the inner cup is placed on top with pressure and hot water or other liquids are poured into the inner cup. The infused liquid is poured out while the residue is retained in the outer receptacle.—Sc. Am., Sept. 29, 1917, 223. (O. R.)

Filter Press.—*Pharmaceutical Use of.*—The principles underlying the use of the filter press as well as its construction and manner of use are discussed at some length in a paper under this title, by James F. Couch and James E. Kersey.—Am. J. Pharm., 89 (1917), 71. (R. P. F.)

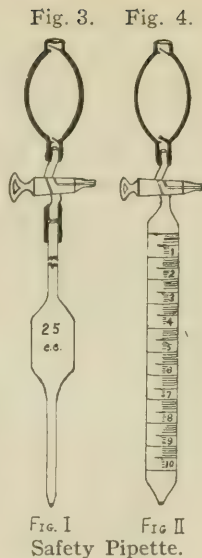
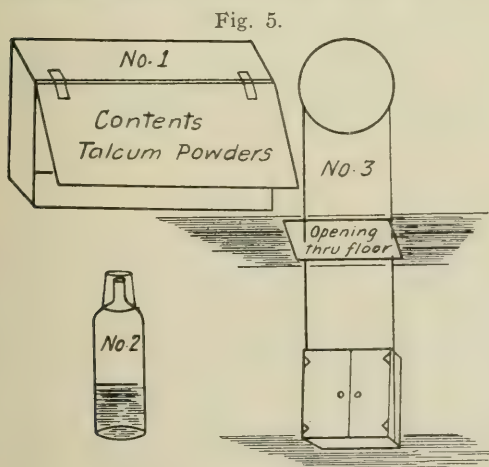
Melting Points.—*Determination at Low Temperatures.*—Stock describes two forms of a device to determine a melting point at low and also at high temperatures in a non-transparent bath. A ring of the solid substance is deposited on the wall of a thin tube (about 6 mm. wide), a short distance from the sealed end and a thick glass rod (about 2 mm. wide), elongated to act as a pointer, is rested on it. When the upper end of the pointer begins to sink the melting point is taken.—Ber., 50 (1917), 156; through J. Chem. Soc. Abs., 1917. (A. V.)

Safety Pipette.—*New Form of.*—A. S. Behrman has devised the form of safety pipette shown in the illustrations (Figs. 3 and 4),

which consists of a properly valved atomizer bulb, a three-way stopcock and an ordinary pipette, which can be either the one volume or the graduated form of the Mohr type.—J. Ind. Eng. Chem., 9 (1917), 1047.

Stock Room Conveniences.—William Mittelbach describes some simple devices to protect surplus stock from light and from high temperature as well as for the saving of space. The illustrations show (Fig. 5): 1. A hinged box from packaged chemicals and specialties; 2. A stock bottle containing liquids protected by covering the stopper with small glass tumbler; 3. A dumb waiter by means of which bottles of official syrups may be stored in the cellar until needed at the dispensing counter.—J. Am. Pharm. Assoc., 6 (1917), 1048.

Suppository Holder.—The local treatment of hemorrhoids by means of suppositories has not proved so satisfactory as might be expected, since it is practically impossible to keep the medication constantly in contact with the affected area. As usually employed, the suppository slips past the hemorrhoids and is in contact with them only during insertion and subsequent defecation. To meet this difficulty, V. Berghind has adopted the expedient of wrapping the suppository in a piece of gauze, which at the conical end spreads out like a fan. The portion of the gauze containing the suppository is



then dipped in melted gelatin basis, which thus forms a sort of capsule, from one end of which the rest of the gauze forms a projecting fan-tail. The gelatin-coated suppository is inserted thick end foremost. The constriction at the thinner end is then grasped by the sphincter, which anchors it by the projecting gauze tail and keeps the parts in contact with the drug. Before the suppository is inserted, an enema should be given: the patient should be recumbent for some hours after the insertion. One should be given early in the morning and another in the evening. It should be dipped in hot water immediately before insertion. The following formulæ are recommended: (1) Peruvian balsam, 1 Gm.; ichthyol, resorcinol, of each, 1.5 Gm.; bismuth gallo-iodide, 6 Gm.; bismuth subgallate, zinc oxide, of each, 3 Gm.; lanolin, 3 Gm.; cacao butter, 18 Gm. (2) Peruvian balsam, 1.5 Gm.; resorcinol, 1.5 Gm.; bismuth gallo-iodide, zinc oxide, of each, 6 Gm.; petrolatum, 2.5 Gm.; cacao butter, 14 Gm.—Hygeia; through Pharm. J., 98 (1917), 209.

Weights and Graduates.—*Inaccuracy of Some.*—At the meeting of the Wisconsin Pharmaceutical Association, G. J. Weigel, State Dairy and Food Commissioner, gave an address on the subject of defective weights, scales and graduates. He states that in 1915, 26.3 per cent. of glass graduates tested by city dealers were found defective, whereas only 14.5 per cent. of tin measures were found inaccurate; that 24.2 per cent. of the prescription weights were found above or below standard, whereas only 10.3 per cent. of other types of weights were found inaccurate. He discusses the causes of these deviations and points out that many prescription balances lack in sensitivity.—Pharm. Era, 50 (1917), 85.

Working Hints.—A. W. Bromley contributes a series of ideas (some of them new) that he has found useful in the drug store routine. In his poorly heated store, he keeps fluids likely to freeze in a pound tin box attached just above a gas lamp. He recommends the use of home-made mixing bottles, which can be graduated either by a paper strip or with a diamond cutter. He keeps such oddments as spatulas, knives, pencils and rubber stamps on his desk by tying them to a long string and passing the string through a ring-screw.—Pharm. J., 98 (1917), 40.

STERILIZATION.

Cocaine.—*Sterile Solutions of.*—T. Baumeister reports on various cases of inflammation of the eyes produced by non-sterile cocaine solutions. He therefore advises never to keep the cocaine solutions for any length of time and to use freshly prepared solutions which should be boiled for 3 minutes immediately before use. He further claims that tyndalizing at 58° does not render cocaine solutions sterile and that by prolonged heating at a higher temperature the solutions are decomposed. Ebert, however, claims that cocaine solution can be sterilized without danger in a current of steam and that any decomposition of the solution which may take place is not produced by the high temperature but by the alkalinity of the glass in which the heating is carried out. When alkali-free glass is used, a sterilization for $\frac{3}{4}$ to 1 hour in a current of steam does not affect cocaine solutions in the least. Naturally the solutions should be kept in containers made of alkali-free glass.—Pharm. Ztg., through Pharm. Weekblad, 54 (1917), 647. (H. E.)

Morphine Hydrochloride.—*Decomposition of Solutions on Sterilization in Ampuls.*—K. Schaefer and C. Stich have tried to solve the question whether or not morphine hydrochloride solutions undergo a decomposition when sterilized in ampuls by applying an optical method. In former years it was assumed that a more or less intense yellow color showed a more or less strong decomposition. It was found that all alkaloidal solutions and of the morphine salts especially morphine hydrochloride show a characteristic absorption spectrum in the ultraviolet. The yellow color obtained at times in sterilizing morphine solutions is absorbed by the blue of the spectrum, so that by comparing the spectra of an unsterilized solution and a yellow sterilized solution a decomposition of the sterilized solution can be ascertained. They found that a solution which is colored only slightly yellow has not undergone any appreciable decomposition. Naturally a separation of morphine from the salt by the alkalinity of the glass should be prevented and this can be done by adding to each 100 mils of the solution 0.5 to 1 mil of N/10 hydrochloric acid or dissolving the salt in N/1000 hydrochloric acid solution.—Apoth. Ztg.; through Pharm. Weekblad, 54 (1917), 1459. (H. E.)

Pharmaceutical Products.—*Sterilization of.*—J. A. Dean makes a plea for the pharmacist to prepare himself to make and furnish to both physician and public alike sterile solutions and preparations. He includes among these such articles as solutions for hypodermoclysis, ampuls, eye solutions, and other pharmaceutical preparations. He thinks it would be of considerable advertising value to the pharmacist to have the public know that he had the ability to sterilize such articles as medicine and eye droppers, tooth brushes, and catheters. He lays particular stress upon the necessity of pharmacists appreciating just what is meant by the word "sterile," that there can be no such thing as "approximately sterile;" he must learn to acquire the bacteriologist's absolute sense of cleanliness.—Proc. Penna. Pharm. Assoc., 40 (1917), 146. (J. K. T.)

Sterilized Solutions.—*Methods of Dispensing.*—J. L. Lascoff is of the opinion that with the aid of the Pharmacopœia and the National Formulary, pharmacists should be able to overcome any problems that may arise in connection with the proper sterilization of solutions. By consulting the chapters on methods of sterilization as recommended in these two books he thinks that the pharmacist will at all times be able to carry out the wishes of his medical clientele who insist on having absolutely clean solutions. He gives a list of prescriptions which he has had an occasion to work with in this regard.—Pract. Drug., Aug., 1917, 27. (J. K. T.)

CONTAINERS.

Glassware.—*The Chemistry of.*—R. L. Frink describes the evolution of the glass industry in the United States. He enumerates some of the reasons of loss in production and lack of satisfaction as to quality in the different branches of glass industry, and he urges the employment of chemists and scientists for the purpose of investigating and preventing these losses. The glass manufacturers are usually men who have grown up in the business and have been compelled to devote their time to the practical problems as they saw them and had no time to investigate the possibilities of scientific research. Among the illustrations he presented the following: Lime containing 50 to 60 per cent. CaO and 20 to 30 per cent. MgO (instead of 80 per cent. CaO and 2 per cent. MgO) produces "cordy" or "stringy" glass. He

urges that the supply dealers and chemical manufacturers should furnish materials of constant or known composition, and that the glass manufacturers should employ chemists to analyze the raw and finished products. He also advocates the foundation of research laboratories for investigating problems of glass-making.—*Sc. Am. Suppl.*, No. 2186, Nov. 24, 1917, 330. (O. R.)

Pharmaceutical Glassware.—*The Solubility of.*—V. Coblenz directs attention to the decomposition of many substances caused by the soluble matter in the glass containers, mentioning among others solutions of the alkaloids, spirit of nitrous ether and solution of hydrogen dioxide. The composition of ordinary and many special glasses and the methods for determining the solubility coefficient of the bottles are given in the paper, as well as tabulated results of the solubility determined in twenty-seven glass containers of different kinds of glass.—*Proc. N. J. Pharm. Assoc.*, 47 (1917), 47. (J. H.)

Porcelain.—*Type for Chemical Work.*—Henry Watkins sketches the history of the manufacture of porcelain in Europe from about 1673, when the first attempts were made to imitate Chinese ware, until the present day, and remarks that it is almost impossible to give a definition of chemical porcelain which would generally be regarded as entirely satisfactory. Translucency is only one of the properties of porcelain, and much of the beautiful porcelain of England has been found useless for laboratory and other technical purposes. Among other purposes for which chemical china is applied, the following are the more important: Evaporating solutions to dryness, igniting precipitates in blow-pipe flame, filtering purposes, receptacles for mercury, and water-baths. In deciding on the possibilities of the manufacture and the manner of procedure, it is desirable to consider the relative importance of the qualities required which may be ranged as under: Resistance to very sudden changes of temperature, the resistance of the glaze to chemical reagents, the color of the porcelain which preferably should be white or cream, the fusing point of the glaze, the weight of the material, composition, and translucency. The rest of the paper deals with manufacture of porcelain and with comparison of continental and English brands.—*Pharm. J.*, 99 (1917), 89.

Silica Ware.—Frank Browne finds that apparatus of fused opaque silica possesses several advantages over porcelain. The use of silica basins is to be recommended particularly just now, as a considerable saving in the consumption of porcelain can thereby be effected. The many evaporations to dryness or to a low bulk, inseparable from laboratory work, form one of the chief causes of the breakage of ordinary porcelain. With silica vessels there is usually no loss from this source. Experience has shown that silica basins in ordinary handling require a good deal of care, as they are somewhat easily fractured by hard treatment. Users may be glad to know that a cracked basin may generally be rendered quite serviceable for most purposes. Add linseed oil to red lead till just fluid; then, with the finger, rub a little of the mixture on the outside of the basin, working it well into the fracture. Allow to dry two or three days, then slowly heat over a Bunsen flame, and the vessel will be repaired. Half liter basins, cracked in several places, have been thus treated, and subsequently for many months have been used for evaporating liquids containing more or less quantities of nitric acid.—Pharm. J., 99 (1917), 86.

Vessels.—*Tinned Copper Superior to Tinned Iron.*—Tinned copper is better than tinned iron for vessels and apparatus for 3 reasons. They can be kept bright not only inside but also outside; it pays to re-tin them and, lastly, tin and copper do not interact, while tinned iron produces a chemical reaction, blackening and spoiling the liquids contained therein.—Sc. Am., Sept. 29, 1917, 227. (O. R.)

MISCELLANEOUS.

Adhesives.—George N. Hoffman has enumerated the various uses for mucilages and gives four recipes for different purposes.

For labels exposed to the weather:

For labels exposed to the weather.

Shellac.....	4 ounces
Borax.....	1 ounce
Water (boiling).....	1 pint

A strong adhesive, after a recipe by Hiscox.

Borax.....	60 parts
Water.....	420 parts

Dissolve and add to the mixture:

Dextrin.....	480 parts
Glucose.....	50 parts

Heat carefully not above 90° C. with constant stirring until the whole is in solution. Replace the water that has evaporated and filter through flannel.

For joining metallic surfaces.

Rub first with an alcoholic solution of hydrochloric acid and apply a thin coat of the following mixture:

Tragacanth.....	10 parts
Honey.....	10 parts
Wheat flour.....	1 part

For marine use.

Caoutchouc.....	120 parts
Benzene.....	20 parts

Add to 20 parts of melted asphaltum. Pour into moulds. When needed soak in boiling water and heat until liquid.—Drug. Circ., 61 (1917), 184. (F. H.)

Bacteria and Fungi Exterminators.—Under a patent granted to W. R. Kneckner, the following mixtures are to be used as fungicides: Equal parts by weight of potassium ferricyanide and potassium thiocyanate; a mixture of hexamethylenetetramine and ammonium cyanide; a mixture of equal quantities of methylene blue, methyl violet, malachite green and potassium xanthate; and a mixture of flavoring extracts, oxalic acid and gelatin.—C. U. C. P. Al. J., 24 (1917), 148. (G. C. D.)

Baking Powder.—*Gas-Producing Power of.*—In his report as Public Analyst of Sheffield, John Evans states: "Apart from considerations of the wholesomeness of the ingredients, it is evident that the gas-producing power of a baking powder is its most important characteristic. An article which has been badly made, or which has so much deteriorated through prolonged keeping under unsuitable conditions as to be incapable of producing a reasonable amount of carbonic acid gas, is necessarily an unsatisfactory one, and, in my opinion, is not of the nature, substance, and quality demanded, but unfortunately there is no legal definition as to what proportion of gas a baking powder should yield. The amounts of gas yielded by the five samples of baking powder

received were: 1.03 per cent., 3.15 per cent., 4.51 per cent., 5.72 per cent., 14.08 per cent. It will be noticed that the amount of gas yielded by these samples varies from 1.03 to 14.08 per cent. The amount of carbonic acid gas evolved by the first sample was so small as to render the sample of little value as a baking powder. A good average baking powder should yield about 10 per cent. of available carbonic acid gas."—Pharm. J. Supp., Sept. 15, 1917, XVIII.

Bandages.—*Paraffin-Covered.*—Fisher (J. "Am. Med. Assoc.," 66, 939) has suggested as an impermeable wound covering the use of bandages that have been dipped in melted paraffin. Sollmann has modified the Fisher procedure by painting the outer layers of an ordinary wound bandage with melted paraffin.—J. Am. Med. Assoc., 68 (1917), 1178.

Cardboard.—*Impermeable.*—A cardboard or pasteboard is made impermeable, according to M. Serebrianyj, by treating ground and boiled wood pulp with fir-wood extract, technically known as "resinous glue," using 8.5 kilogrammes of the latter together with 7 kilogrammes of rosin for each 150 kilogrammes of wood pulp. The resinous products are first dissolved in either alcohol, ether or benzene, making a 20 per cent. solution, before mixing with the wood pulp. The pulp to be impregnated need not be wood pulp, but may consist of rag shreds or paper shreds, or mixtures of these. Depending upon the degree of impermeability desired the quantity of impregnating material used varies from 4.5 to 70 kilogrammes for each 150 kilogrammes of the pulp.—C. U. C. P. Al. J., 24 (1917), 42. (G. C. D.)

Catgut.—*Treatment before Sterilization.*—Before the sterilization of catgut, the grease added to make it more supple must be removed and this is usually accomplished by aid of some fat solvent. E. Desquelle finds that for this purpose 90 per cent. alcohol is more effective than is ether, benzene or chloroform. The alcohol, however, removes material other than fat. Thus while 100 grammes of catgut yielded to ether at 35.5°, 1.92 gramme of fatty matter, the sample of catgut thus treated yielded to 95 per cent. alcohol at 79°, 3.16 per cent. of soluble matter. A separate sample of the same catgut yielded to alcohol alone 3.31 per cent. of

soluble matter. Benzene dissolved out only 1.48 per cent. and chloroform extracted only 1.5 per cent. of extractive.—Bull. sci. pharmacol.; through Chem. Abstracts, 11 (1917), 1879.

Dentifrices.—*Composition of Modern.*—That public demand increases the manufacture of one style or another of any product is equally true of modern dentifrices as well as other proprietary articles. Present-day dentifrices may be grouped as (1) Dry powders, (2) Pastes, (3) Solid soaps, (4) Fluids. The aim in manufacturing modern dentifrices says "The Lancet" is to combine in an attractive way a germicide, antifermentative, deodorant and antacid with a mechanical detergent. This combination is not difficult, but unless carefully prepared a dentifrice may be more harmful than good. From analysis, the most common detergent and antacid is chalk finely triturated; kieselguhr and talc, as mechanical agents, are open to question since they are non-acid neutralizing and may contain gritty impurities. Soap, a common constituent associated with chalk, is a cleanser, antacid and an adjuvant; glycerin and sugar are used as excipients but with doubtful benefit. The germicides are usually the essential oils or the aromatics as thymol, carbolic acid, benzoic acid, hydrogen peroxide, oils of wintergreen, peppermint and cinnamon which is said to be very antiseptic. Nineteen samples purchased in the open market were analyzed and the results tabulated; this tabulation shows the composition and character of the samples.

(1) *Dry Powders.*—Actual results of the examinations of the samples show by the table that chalk was present in varying quantities in all samples. All but two contained soap; antiseptics as phenol, thymol, and eucalyptol were present in all samples. Two contained available oxygen which would tend to bleach the teeth. Orris root was generally used for perfuming.

(2) *Pastes.*—Greater variety of ingredients are used in these samples but they were better preparations because the chalk was well triturated. Besides chalk there were found sugar, soap, starch, silica, areca, benzoic acid, wintergreen, thymol or mint; the presence of the starch and sugar are undesirable, for they readily hydrolyze.

(3) *Soap Dentifrices.*—These were combinations of chalk, phenol or an essential oil mainly cinnamon with soap. The chalk was badly comminuted.

(4) *Fluid Dentifrices*.—Alcoholic solutions of essential oils having antiseptic deodorant qualities but no detergent action.—Chem and Drug., 89 (1917), 95. (M.O'C. D.)

Dentifrice.—*A New Type*.—According to a note in the "British Journal of Dental Science," a dentifrice to remove the protein or mucin film on teeth has been devised, and is evidently the subject of a patent. It contains a proteolytic enzyme and an agent to render the enzyme active as a digestant, together with an abrasive agent. The composition is given as follows: Tricalcium phosphate, 28 ounces; oil of peppermint, $2\frac{1}{2}$ fluidrachms; gum tragacanth, 240 grains; sugar, 720 grains; solution of pepsin, acidulated with hydrochloric acid not exceeding 5 per cent., 16 fluidounces. Petroleum jelly may be added in any proportion. Instead of pepsin, other proteolytic enzymes may be employed with acid calcium phosphate in the same manner as pepsin. Pancreatin, however, must be used with an alkaline or neutral base, such as tricalcium phosphate, precipitated chalk, magnesium carbonate, or milk of magnesia. The composition may be in the form of a powder or paste.—Pharm. J., 98 (1917), 365.

Fly Larvæ.—*Destruction in Manure*.—Cook and Hutchinson find the best larvæcide is borax; two pounds to 28 gallons of water being sufficient for 24 bushels of manure. They also find effective 8 ounces of green hellebore in 10 gallons of water; this being enough for 8 bushels of manure. Calcium cyanamide ($\frac{1}{2}$ pound to the bushel of manure) is also useful as it improves the fertilizing value of the manure. Potassium cyanide, Paris green, and arsenical sheep dips are too dangerous for general use.—U. S. Dept. Agric. Bull.; through Am. J. Pharm., 89 (1917), 282.

Grease Pencils.—*For Surgical Use*.—According to F. Richard, the following recipes are suitable for the production of pencils for marking the skin for surgical purposes, especially in radioscopy. The suet and hard paraffin used should be of a melting point of $48-50^{\circ}$ C. For a black pencil: Lampblack, 1.6; suet, 4.0; hard paraffin, 6.0. Blue: (1) Prussian blue in very fine powder, 5; suet, 2; hard paraffin, 3. (2) Ultramarine, 7; suet, 4; hard paraffin, 6. (3) Indigo, 6; suet, 4; hard paraffin, 6. (4) Methylene blue, 15; suet, 4; hard paraffin, 6. Red: The same quantities of vehicle

are used with carmine (No. 40), 6; vermillion, 20; cinnabar, 20; eosin (aqueous), 15. When vermillion is used, the suet and paraffin must be saturated with eosin.—J. pharm. chim., 15 (1917), 75.

Label Varnish.—L. Vink finds that labels first coated with collodion, applied with a hair pencil and subsequently coated with two applications of varnish transform the ordinary paper label into a more or less permanent label which adds to the appearance of the bottles on the shelves. The varnish is made by dissolving gum mastic and gum sandarac in ethyl alcohol. He fails, however, to give the proportions for making this varnish.—Proc. Penna. Pharm. Assoc., 40 (1917), 145. (J. K. T.)

Nickel-Plated Articles.—*Cleansing of.*—Nickel-plated articles which have become dull can readily be restored by means of alcohol to which 2 per cent. of sulphuric acid has been added. The liquid is applied liberally, and after a few seconds is washed off with clean water. The surfaces are then rubbed over with a swab dipped in fresh alcohol, containing no acid, and finally polished with a dry cloth. This method, it is claimed, will give brilliance to the dullest piece of nickel-plating without damage.—Profes. Photographer; through Pharm. J., 99 (1917), 28.

"Onguent de Saint-Fiacre."—This mixture, which is recommended by Courtois as a stimulant for the roots of transplanted plants, is made by dissolving 10 kilos of ferrous sulphate in 100 liters of water and then adding to the mixture sufficient cow manure, horse manure and clay to make a semi-solid mass, and to each 100 liters, 1 kilo of dried blood is added.—L'Union pharm.; through Drug. Circ., 61 (1917), 133.

Pastes for Horn.—For pasting pieces of horn together is recommended a glue obtained by dissolving four parts of shellac in alcohol and adding to the solution sufficient copal to obtain a stiff mass, or a glue prepared by dissolving 7 parts of caoutchouc in 5 parts of chloroform and mixing the solution with 1.5 parts of mastic. For cementing mother-of-pearl, a mucilage obtained from 4 parts of isinglass, 2 parts of rosin and one part of ammoniacum or an alcoholic solution of rosin mixed with gelatin can be

used. For pasting small plates of mother-of-pearl on other objects a mixture of 4 parts of rosin, 2 parts of mastic and one part dammar is recommended. Bakelite is glued together with a solution of Para caoutchouc and copal in chloroform.—*Neueste Erfind. und Erfahr.*; through *Pharm. Weekblad*, 54 (1917), 218. (H. E.)

Protective Paint.—*A Sulphur-Graphite.*—T. Latham recommends the following protective paint for the copper roof of the Congressional Library:

Precipitated sulphur.....	1 pound
Graphite.....	2 pounds
Boiled linseed oil.....	1 gallon

—*Sc. Am.*, Sept. 29, 1917, 227. (O. R.)

Putty.—*Softening.*—When removing glass panes the putty can be softened by covering for a few hours with soft soap.—*Chem. and Drug.*, 89 (1917), 939. (K. S. B.)

Sealing Wax Substitute.—R. Castello has patented a sealing wax substitute composed of 350 grammes of rosin, 300 grammes of pure rubber, 100 grammes of naphtha, 100 grammes of sulphur and 200 grammes of dry lead carbonate. The rosin is melted in copper vessel, the other ingredients are added and the mixture is heated until it is uniformly fused, when the fused mass is poured into molds. The mixture may be colored red by the addition of 40 grammes of vermilion.—*J. pharm. chim.*, 15 (1917), 399.

Shaving Brushes.—*Why Badger Hair.*—W. R. Wright states that the best shaving brushes are made from the hair of Siberian or Macedonian badgers. The skins of these animals find their way to Germany or America where the hair is prepared for the brushmakers either by cutting it from the hide or by treating the inner side of the hide with lime which eats into the hide and loosens the hair which can then be pulled out. The finer grades of hair are those tipped with white known as "silver-tipped." Not more than 26 to 30 pounds of suitable hair can be obtained from 250 skins, which make a corresponding small number of brushes. Badger hair is tender and soft; to give elasticity and durability, white bristles are added to the hairs in the manufacturing of the brushes.—*Am. Drug.*, 65 (1917), 493. (M. O'C. D.)

Sphagnum Moss.—*As a Surgical Dressing.*—In England, sphagnum moss, or peat moss, is being used as a substitute for absorbent cotton. The dried moss is said to absorb twenty-two times its own weight of water, while absorbent cotton will not absorb more than six times its weight. For surgical use the dried moss is packed loosely in muslin bags which are then sterilized by heat or by chemicals such as mercuric chloride.—J. Am. Med. Assoc., 69 (1917), 1790.

Sizes and Finishes.—*Analysis.*—M. C. Lamb and A. Harvey made a large number of analyses of animal and vegetable products used in the sizing and finishing of various textile fabrics, leather, etc., and also suggest certain standards.

Egg and blood albumin should be completely soluble in 1 per cent. caustic soda and should dissolve readily in water at 45° C. Albumin is liable to be adulterated with gelatin, which is readily detected with 1 to 2 per cent. of tannic acid. Fine salts are often added as antiseptics and also to increase the viscosity of the solution.

Chondrus, carrageen or Irish moss, a thickening agent, should contain 1.4 to 2.5 per cent. algin.

Tragacanth should have the following standards: Saponification values 100 to 180, water 18 to 22 per cent., and mineral ash 2.5 to 3 per cent. Indian gum, a substitute, gives an acid transparent mucilage, whereas tragacanth produces a neutral, opaque mucilage and a blue color with iodine, not given by Indian gum.

Acacia or gum arabic varies from white and soluble (African) to dark and insoluble (Indian), the usual adulterant being dextrin. Acacia, but not tragacanth, is precipitated by basic lead acetate solution. The acidity is 2.5 to 3 per cent. of free arabic acid.

Gum Tragasol is extracted from the locust bran, as a substitute for tragacanth.

Casein is analyzed for moisture, fat (0.2 to 0.6 per cent.) and nitrogen.—J. Soc. Dyers and Col.; through Sc. Am. Suppl., No. 2157, May 5, 1917, 276. (O. R.)

Sponge.—*Properties of Rubber.*—Owing to its cellular structure its density is only 0.05, the lowest of all solids. It is water-tight and very nearly gas-tight. As it will not waterlog and conforms

easily to the lines of the body it is employed as life preservers. All kinds of floating devices, such as buoys, markers, etc., may be improved by its use.—*Sc. Am. Suppl.*, No. 2188, Dec. 8, 1917, 362. (O. R.)

Stains.—*Removal of.*—An unsigned article gives directions for the removal of various stains likely to follow work in the laboratory. Included are those made by iodine, silver nitrate, chrysarobin, resorcin, picric acid, pyrogallol and coal-tar colors.—*Nat. Drug.*, 47 (1917), 263. (C. M. S.)

Straw.—*New Uses for.*—J. F. Tocher recommends the use of surplus straw in the manufacture of paper, for treatment as an agent for promoting growth of nitrogen-fixing organisms suitable for plant culture or for the manufacture of more digestible straw by treatment with soda solution.—*Chem. and Drug.*, 89 (1917), 812. (K. S. B.)

Wood.—*Artificial Seasoning of.*—According to a U. S. patent, dated January 2, 1917, the wood is subjected to the action of a gaseous primary oxidation product of an alcohol, such as an aldehyde, together with a volatile amine, the latter acting in the nature of a catalytic agent. Tannins, albumins, carbohydrates and other constituents of wood are thus converted into compounds of a high molecular value.—*C. U. C. P. Al. J.*, 24 (1917), 63. (G. C. D.)

C—PREPARATIONS

AQUÆ.

Chloroform Water.—*Use in Gastric Pain.*—Pron states that although chloroform water is freely prescribed for gastric disturbances, it should never be given when the trouble arises from an irritated stomach. In cases of hyperacidity and whenever the gastric mucous membrane is irritated, chloroform water will do more harm than good, since it is itself an irritant to the stomach. It should be prescribed solely for those cases in which the pain is of purely nervous origin.—*J. pharm. chim.*, 16 (1917), 50.

Orange Flower Water.—*Bacillus Producing Green Color.*—R. Guyot finds that the organism producing the green color (see Year

Book, 1916, 62) is closely allied to, if not identical with, *Bacillus chlororaphis*. This bacillus was discovered by Laseur in ordinary water, at Vigneulles. It does not show very vigorous growth in orange flower water, and only develops the green tint when the containing vessel is exposed to air and light. It grows with much greater luxuriance in a number of liquid and solid nutrient media. In all these, however, it very rarely develops the green color which it forms under similar conditions in orange flower water. Its occurrence in the latter is probably due to the tap water used to rinse the vessels before filling them with the distillate.—J. pharm. chim., 15 (1917), 12.

CAPSULÆ.

Gelatin Capsules.—*Manufacture of.*—Alice T. Harmer gives an interesting description of the methods used in the manufacture of elastic capsules, stating that they are made from the finest grade of gelatin and glycerin. The hard capsules are made from a solution of gelatin minus the glycerin.—Proc. Penna. Pharm. Assoc., 40 (1917), 239. (J. K. T.)

Gelatin Capsules.—*Manufacture.*—In an illustrated article Harmon W. Marsh describes the manufacture of "Glue Jackets for disagreeable medicines." Dry capsules are made from a very refined gelatin, so expensive as to be prohibitive for cooking purposes. The supply formerly came from France, but a grade is now made in Michigan that is superior to that produced elsewhere in the world. The largest capsule factory in the world is owned and operated by a firm of pharmaceutical chemists in Indianapolis, Ind. The daily output is 2½ million empty capsules.

The inspected gelatin is first soaked in cold water for 3 or 4 hours and the softened gelatin is melted in hot water-jacketed tanks and then feeds the machines. These are operated by electricity and contain pins, both body and cap, of non-corrosive phosphor-bronze, on which the capsules are molded. These pins are on bars, which are on endless chains, and are dipped into and coated with gelatin. After being left in the curing chamber for about one hour, the gelatin coating on the pins is trimmed and the two halves are forced together. The finished capsules are

then blown into a receptacle by compressed air. The machine works automatically and neither gelatin nor capsule comes in contact with human hands.—*Sc. Am.*, Sept. 15, 1917, 194. (O. R.)

Gelatin Capsules.—*Insolubility of Soft.*—E. W. Dershimer of the Health Board of British Guiana reports that soft gelatin capsules containing thymol were very much less soluble in a hydrochloric acid-pepsin solution than ordinary hard gelatin capsules used as controls. He reports that the Malaya Board found that soft gelatin capsules, containing oil of chenopodium, furnished by an American firm were not readily soluble in a pepsin solution or the alimentary tract, and Dr. Dershimer found that two lots of capsules furnished by two American firms were also not readily soluble.—*J. Am. Med. Assoc.*, 69 (1917), 1508. (W. A. P.)

CARBASUS.

Petrolatum Gauze and Cotton Sponges.—Torald Sollmann finds that for dressing moist wounds, sponges made of compressed cotton wrapped in gauze (cheese cloth) saturated with liquid petrolatum are very serviceable. The cheese cloth is dipped into liquid petrolatum and the excess squeezed out. That gauze impregnated with liquid petrolatum is better than untreated gauze is due to the protection that the oil furnishes against swelling of the thread and obstruction of the mesh.—*J. Am. Med. Assoc.*, 69 (1917), 1073. (W. A. P.)

Petrolatum Gauze.—*Non-Adherent.*—R. Delaunay has used a gauze impregnated with a solution consisting of 2 grammes of iodoform, 2 grammes of liquid petrolatum, 40 mls of ether and 65 mls of 95 per cent. alcohol. This, however, was found unsatisfactory and expensive, so he now uses as impregnating fluid, 80 mls of ligroin, 30 grammes of liquid petrolatum and 30 grammes of soft petrolatum to 100 grammes of gauze. The gauze is piled in layers and the solution poured over them. After one or two hours the ligroin is evaporated by a current of air and the compresses are placed in sterilized bottles. Paraffin was also used in this solution but it imparted too great a rigidity to the gauze.—*Bull. sci. pharmacol.*; through *Chem. Abstracts*, 11 (1917), 1879.

CATAPLASMÆ.

Ginger Poultices.—*Non-Blistering.*—Ginger poultices are recommended in place of mustard poultices as they are found to be non-blistering.—Chem. and Drug., 89 (1917), 1045. (K. S. B.)

CERATA.

Paraffin Films.—Considerable attention has been directed to the method of Barthe de Sandfort for the treatment of burns. This consists of the application of a proprietary modification of hard paraffin known as "ambrine," which is sprayed in a melted state over the burn, and allowed to congeal. It has, undoubtedly, given most satisfactory results. A. J. Hall found that these were due entirely to the physical properties of ambrine, the constitution of which is a trade secret; but which is probably hard paraffin modified by exposure to high temperature, such as that of superheated steam. Even better results than those obtained with "ambrine" have followed the use of an antiseptic base prepared as follows: Paraffin, 67, is melted, soft petrolatum, 25, and olive oil, 5, are added. Resorcinol, 1, dissolved in a little alcohol, is then added, followed, when the mixture has cooled to about 55° C., by eucalyptus oil, 2. This is known as "No. 7 paraffin." Since resorcinol is now difficult to obtain, the formula may be modified thus: Beta-naphthol, 0.25; eucalyptus oil, 2; olive oil, 5; soft paraffin, 25; hard paraffin, 67-75. The burn is washed with sterile water and dried by placing a piece of dry gauze over the surface. Melted "No. 7 paraffin" at 50° C. is then gently brushed over the surface with a sterile broad camel-hair brush. The paraffin base melts at 48° C., so the necessary temperature for application may be taken at the point when a pellicle begins to form on the surface of the melted ointment. A spray may be used, but is unnecessary except in very painful burns. When set, the paraffin coating is covered with a thin layer of cotton. This cotton is treated with a second coating of "No. 7 paraffin," and then finished with the usual bandage. At first, the burns are usually dressed daily. Very septic lesions should be first cleansed with warm boric acid fomentations; the results obtained have been excellent. The treatment is equally efficacious for ulcerated frost-bite of "trenchfoot."—Brit. Med. J.; through Pharm. J., 98 (1917), 65.

The Paraffin Treatment of Burns.—Surgeon Colonel Hurd has used a preparation made according to the following formula for nearly a year on the Russian front with highly satisfactory results:

Resin.....	1 part
Beeswax.....	1 part
Paraffin.....	4 parts

Melt in a dish set in boiling water for half an hour. Apply with a metal spray to form a thin layer on the affected surface. Next cover with a very thin layer of cotton, while the wax is still hot, and then with a camel-hair brush paint on three or four layers of the wax. After it has hardened for ten minutes bandage.—*Lancet*; through *Pharm. J.*, 98 (1917), 477.

Paraffin Films.—P. N. Leech reports that the composition of ambrine is essentially: paraffin (m. p. 48.6°), 97.0 per cent.; fatty oil (sesame?) 1.5, asphalt-like body, 0.5; coloring matter and undetermined 1.0. He reports that the composition of ambrine has not always been the same. A superior formula is proposed and it is suggested that simple paraffin of suitable physical properties will probably answer as well as any of the mixtures.—*J. Am. Med. Assoc.*, 68 (1917), 1497. (W. A. P.)

Paraffin Films.—Torald Sollmann has instituted experiments to devise a suitable, open-formula preparation which is simple and yet meets all requirements. He suggests that surgeons who desire to experiment with the paraffin treatment of burns use simple preparations of known composition. Ordinary paraffin melting at about 50° C. (122° F.) appears to possess practically the mechanical properties of "Ambrine." A mixture containing some asphaltum (asphalt varnish, Trinidad or Bermudez, "asphalt cement" and Texas asphalt were tried) gives a preparation of superior pliability. Other formulæ are given and their trial suggested.—*J. Am. Med. Assoc.*, 68 (1917), 1037. (W. A. P.)

Paraffin Films.—*Melting Apparatus.*—T. Sollmann suggests two devices to overcome the inconvenience in connection with the paraffin technique of melting the paraffin and keeping it melted at the proper temperature between 55° and 60° C. The first of these, an electrical "food-warmer," is obviously not generally

available, but the second, the "acetate thermostat," can be readily utilized for shop or field practice. The apparatus consists of an ordinary glue-pot. The outer pot is filled two-thirds with official (U. S. P.) sodium acetate (requiring probably something over a pound). The inner vessel holds about a pound of paraffin, the melting point of which should be about 47.5°C . When the sodium acetate in the outer container is melted to 68.5°C . it keeps the paraffin melted at just the right temperature for application for three hours after the pot has been removed from the fire. The paraffin needs no further attention after it has been removed from the fire, until three hours afterwards, when it can be reheated.—J. Am. Med. Assoc., 68 (1917), 1895.

ELIXIRIA.

Aromatic Elixir.—*Rapid Filtration of.*—J. O. Burge offers a method that he has found entirely satisfactory. He uses paper pulp as a filtering medium, and proceeds according to the Pharmacopœia, until it comes to adding the syrup. This he leaves off until after maceration and filtration. Then he adds the syrup, as this is the cause of slow filtration. Instead of throwing the pulp away, he immediately starts a second quantity with it, letting it macerate until needed, when it is filtered and the syrup added to complete it. Thus he keeps a reserve quantity always ready, and finds it a fully saturated and pleasant flavored elixir.—Pract. Drug., March, 1917, 21.

Elixir of the Phosphates of Iron, Quinine and Strychnine.—W. H. Glover regrets that this elixir was omitted from U. S. P. IX and from N. F. IV. As formerly prepared it gave considerable trouble especially in cold weather, but it could be modified successfully according to suggestions made by Prof. Chas. Caspari, Jr., and others. The original article gives detailed procedure.—J. Am. Pharm. Assoc., 6 (1917), 1062. (Z. M. C.)

EMPLASTRA.

Cantharides Plaster.—*New Method of Spreading.*—A. Flett states that he employs with success the following method of making a "fly blister." A piece of parchment paper of suitable size is rubbed over with a few drops of Liquor epispasticus, B. P., and the

cerate of cantharides is spread on it somewhat larger than the required blister by means of a spatula warmed by standing in hot water. The usual paper shape for the blister is laid upon this, and gently rubbed round with the finger. The parchment paper, blister side downwards, is now laid on to a piece of adhesive plaster and rubbed over evenly and firmly with a knife, and the parchment paper is then stripped off. The face of the blister is smoothed, if necessary, by passing a warm spatula lightly and quickly over it, and the paper shape is then lifted off. Two or more blisters may thus be spread at the one operation.—Pharm. J., 98 (1917), 236.

"English Plaster."—*Was It Originally from England?*—Rhane states that the plaster called "English Plaster" was first prepared by Beaumé, an apothecary in Paris in 1785. He allowed ichthyocolla to macerate with water for 12 hours, then heated the mixture to boiling and with the aid of a small brush transferred the liquid to taffeta. This process was repeated several times and the plaster was finally covered with a thin layer of balsam of Peru.—Pharm. Zeit.; through Pharm. Weekblad, 54 (1917), 147. (H. S.)

EMULSA.

Pharmaceutical Emulsions.—*From a Colloidal Standpoint.*—Physical chemists state that an emulsion is a very fine distribution of one liquid phase in another liquid phase. For instance, if oil is added to water carefully so that two layers exist we have a system consisting of two different homogenous parts each of which is called a phase. If we now shake this liquid one phase becomes finely subdivided in the second phase, thus producing an emulsion. The phase that is subdivided is called the disperse or internal phase; the medium in which the disperse exists is called the dispersion medium or external phase. When emulsions are mentioned the pharmacist usually has in mind but one type, namely, oil in water, in which case the oil is the internal phase and water the external phase. Physical chemists, however, recognize two general types: the one just mentioned and the other in which oil is the external phase and water the internal phase. Examples of the latter type are hydrated wool-fat, lubricating grease, etc. In the commercial world the latter are of the most value and importance. For instance, the manufacture of paint belongs to this phase.

Emulsions can always be diluted by adding more of the external phase. Leo Roon then classified the emulsions of U. S. P. VIII as follows: emulsions of almond, asafetida, chloroform, cod liver oil and oil of turpentine are all oil in water type.

Cold cream may be considered an emulsion of an emulsion. The borax solution saponifies the free fatty acid of the almond oil; this soap in turn emulsifies a portion of the oil and wax mixture, as there is not enough to emulsify all of it; the emulsion is then kept finely dispersed by stirring while the wax and spermaceti congeal around it.

In mercurial ointment, mercury is the internal phase; the emulsifier is oleate of mercury and the external phase is the lard-suet mixture. It is classed as a water in oil type as the mercury takes the place of the water.

Ointment of mercuric nitrate is another example of the water in oil type. The internal phase is solution of mercuric nitrate, the outer phase is elaidin.

Hydrous wool-fat is also a water in oil type as the oil is suspended or emulsified in the water.

The ointments of red and yellow mercuric oxides both contain 10 per cent. of water which is emulsified and held in suspension by the fatty mixture which forms the balance of the ointment.

In mercury plaster, the mercury is the internal phase, oleate of mercury the emulsifier and the wool-fat lead plaster base the external phase.

Ammonia liniment belongs to the water in oil type: the cottonseed oil being the internal phase; water, ammonia and alcohol constituting the external phase; ammonium oleate being the emulsifier.

Lime liniment is a water in oil type in which the water is emulsified by a small amount of calcium soap and held in suspension in the linseed oil.

Whether one liquid is emulsified in the second or the second in the first depends on the emulsifier. A hydrophile (affinity for water) colloid, like acacia, sodium oleate, etc., will tend to make water the external phase. A hydrophobe (aversion for water) colloid like magnesium oleate, rubber, etc., will tend to make water the internal phase.—J. Am. Pharm. Assoc., 6 (1917), 263. (I. S.)

Emulsification.—*Theory of.*—Roon and Oesper discuss briefly the various theories of emulsification, basing them upon accepted pharmaceutical practice. By means of experiments based upon a number of liquids immiscible with water and the emulsifying agents acacia and soap, a number of definite critical points of emulsification are shown to exist. These depend upon (a) the quantity of the internal phase, and the emulsifier; (b) the nature of the internal phase and the emulsifier; and (c) the procedure followed in the preparation of the emulsion. The author's agree with Fischer that a hydrated colloid is an essential part of an emulsion, and show that this colloid is most efficiently used if formed at the moment of dispersing the internal phase, that is, the three constituents, the oil, the emulsifier and the water should be blended into the nucleus before any attempt is made at dilution. In this way the most stable forms of emulsions are prepared in pharmacy.—J. Ind. Eng. Chem., 9 (1917), 156. (G. D. B.)

Emulsification.—*Theory of.*—Crockett and Oesper continuing the studies described above use tragacanth and Irish moss. The best tragacanth emulsions are better made by mixing the internal phase, *i. e.*, the oil, and the emulsifier, and then adding the entire amount of water and shaking immediately, than by adding the water in portions, shaking after the addition of each portion.

By making the water and tragacanth into a mucilage and then adding the internal phase and shaking no emulsion is formed.

Irish moss emulsions are not affected by small amounts of alcohol; a trace of soap instantly cracks the emulsion but the presence of more than a trace of soap aids in the emulsification. Glycerin serves to re-emulsify such cracked emulsions, and the presence of glycerin will prevent such cracking.

Acacia emulsions are not cracked by the addition of soap; on the other hand, if an insufficient amount of the emulsifier has been used, the addition of soap before the water supplements the emulsifier.—J. Ind. Eng. Chem., 9 (1917), 967. (G. D. B.)

Emulsification of Oils.—*Influence of Viscosity on.*—C. H. Stocking reports on a series of experiments undertaken with the idea of establishing, if possible, a "viscosity rule" for the making of permanent emulsions. The viscosity was determined by means of an Engler viscosimeter, "the quotient of time of outflow of

200 mils of oil divided by the time of outflow of 200 mils of water at 20° C.,” being the measure of viscosity, “known as the Engler degree.”

The continental method was used, care being exercised to have the manipulation uniform in the preparation of the nucleus, and using great care in the later dilution, the finished emulsions varying in strength from 10 to 60 per cent.

After 10 days' standing the sixteen specimens were graded according to quality. Mr. Stocking has classified these, giving quality (1 to 16), viscosity, percentage, strength and “constant” (product of viscosity multiplied by per cent.).

From this classification, it is evident that the “constant” increases as the quality of emulsion improves. Further experimentation showed that emulsions identical in quality can be prepared from oils having different viscosities providing the percentages are adjusted so that the “constants” are equal.

Having successfully emulsified any oil and determined its “constant” (viscosity times per cent.), the per cent. of any other oil necessary to produce an emulsion of similar quality may be found by dividing the “constant” (above determined) by the viscosity of the oil to be emulsified.—J. Am. Pharm. Assoc., 6 (1917), 952. (Z. M. C.)

Emulsion of Liquid Petrolatum.—M. H. Shimer offers the following recipe:

Soft petrolatum.....	40 grammes
Liquid petrolatum.....	200 grammes
Powdered acacia.....	60 grammes
Syrup.....	50 mils
Jamaica rum.....	50 mils
Water, enough to make.....	500 mils

—Merck's Rep., 26 (1917), 4.

EXTRACTA.

Extract of Aloes.—*Preparation.*—E. H. Madsen examines the method of the Danish Pharmacopœia and is satisfied with the results. He lays stress on the lower temperature used in making the extractions.—Archiv. Pharm. Chem.; through Chem. Abstracts, 11 (1917), 1258.

Extract of Belladonna.—*Assay of.*—Silico-tungstic acid, introduced by G. Bertrand as an alkaloidal reagent, has been used by Javillier for the estimation of atropine sulphate. The precipitate, which is insoluble in acidulated water, possesses the constant composition $4C_{17}H_{23}NO_3 \cdot SiO_2 \cdot 12WO_3 \cdot 2H_2O \cdot 4H_2O$. It loses 4 molecules of water when dried at 120° and yields on incineration 70.45 per cent of residue. H. B. Rasmussen has applied this precipitation method for assaying extract of belladonna, having found that the bases isomeric with atropine are precipitated also. 6 grammes of the extract are dissolved in 5 mls of alcohol and the solution after the addition of 5 mls of 20 per cent. ammonia water is shaken out with 60 grammes of ether. The mixture is allowed to stand for 3 to 4 hours and 50 grammes of the ethereal solution are shaken out with 3 portions of each 25 mls of one per cent. hydrochloric acid. The combined acid solutions, filtered if necessary, are mixed with an excess of about a 10 per cent. silico-tungstic acid solution, the mixture is allowed to stand for 8 hours and filtered. The precipitate is washed with one per cent. hydrochloric acid and incinerated. The weight multiplied by 0.4067 gives the amount of atropine present in 5 grammes of the extract; for each 100 mls of liquid 5.4 milligrammes of atropine should be added, this representing the amount of precipitate soluble in the liquid. The author also applied the various alkaloidal precipitants and found that only by potassium-bismuth iodide and phospho-tungstic acid the atropine is precipitated completely, but that these reagents have no advantage over silico-tungstic acid.—Ber. deutsch. pharm. Ges.; through Pharm. Weekblad, 54 (1917), 1458. (H. E.)

Extract of Coffee.—*Aromatic.*—According to K. von Vietinghoff, when an extract of coffee made by exhausting roasted coffee beans with water and evaporating to dryness is again roasted, the aroma is greatly increased. This can be effected at a temperature of 240° without risk of burning, and the extract so obtained yields with water a clear solution, with a pure coffee odor and taste.—Chem. Ztg.; through Pharm. J., 98 (1917), 353.

Extract of Glycyrrhiza.—*Adulterated.*—Stick licorice of Italian origin, examined by Kreis, was found to consist of wheat and rice flour, glue and a small amount of licorice juice. It contained 10.6 per cent. of water, 2.05 per cent. of ash, 35.5 per cent. of water-soluble matter and 53.9 per cent. of water-insoluble matter.—

Schweiz. Apoth. Ztg., 55 (1917), 641; through Chem. Abstracts (1918).

Extract of Hyoscyamus.—*Crystals Obtained in Manufacture.*—E. I. van Itallie and W. F. Woutman while evaporating a chlorophyl-free percolate of henbane obtained a mass of crystals amounting to about 2.5 per cent. of the henbane employed. The crystals which were colored light brown consisted of 57.9 per cent. of potassium chloride and 31.6 per cent. of potassium nitrate together with extractive matter and traces of aluminum, iron and calcium salts. The occurrence of large quantities of salts in drugs seems to be quite frequent, Kunz-Krause ("Arch. der Pharmazie," 1916, 510) reporting on a mixture of salts obtained in making extract of stramonium. This mixture contained potassium chloride, potassium nitrate, acid magnesium phosphate, neutral magnesium phosphate, calcium oxalate, potassium sulphate and potassium alum. Van Itallie and Woutman, however, report that a careful re-examination of the salt mixture obtained from henbane confirmed the presence of only potassium chloride and potassium nitrate.—Pharm. Weekblad, 54 (1917), 659. (H. E.)

Extract of Opium.—*Preparation of.*—A. Heiduschka and J. Schmidt report on experiments made with opium extract. The drug was exhausted by maceration with water and the aqueous extract was evaporated (a) on the water-bath with frequent stirring, (b) in a vacuum at 50°, (c) in a vacuum at 70° and (d) on a water-bath with only occasional stirring.

The following results were obtained:

	Opium.	Ext. A.	Ext. B.	Ext. C.	Ext. D.
Ash per cent.....	5.05	5.45	5.50	5.40	...
Alkalinity of ash in mils					
of n. alkali.....	7.07	3.20	3.37	3.30	...
Morphine, per cent....	11.70	21.82	23.89	23.89	22.40
Narcotine, per cent....	7.34	2.26	2.56	2.40	...
Codeine, per cent.....	1.57	1.13	1.71	1.25	...
Appearance.....	Normal	Greyish brown	Light brown	Light brown	Greyish brown
Solubility in water.....	...	Difficultly and turbid	Easily and clear	Easily and clear	Difficultly and turbid
Insoluble per cent.....	...	3.57	0.10	0.10	3.10

These experiments show that extract of opium should be prepared in a vacuum. The turbidity of the aqueous solutions of extracts not prepared in a vacuum is not due to resinous substances but to humin-like products. The smaller percentage of morphine in extracts prepared by evaporating on a water-bath, is due to the action of the oxygen of the air, which probably in conjunction with the action of oxidases converts the morphine into a number of substances, one of which is oxydimorphine. The oxidation process is facilitated by stirring the extract during the evaporation.—Arch. Pharm.; through Pharm. Weekblad, 54 (1917), 1027. (H. E.)

FLUIDEXTRACTA.

Fluidextract of Cinchona.—*Preparation and Analysis of.*—Oliver Chick has made careful investigations with a view of clearing up the contradictory statements made by various analysts on the amount of alkaloid which could be extracted from red cinchona bark by macerating with dilute hydrochloric acid.

The author has never found an extract to yield more than 40 per cent. of the total alkaloids found in the sample of bark used.

Tests for standardization are included in the same account.—Pharm. J., 99 (1917), 144. (F. H.)

GLYCERITA.

Glycerite of Starch.—*Use in Dentistry.*—J. T. Hall recommends the use of glycerite of starch as a vehicle for dental remedies. For instance, he finds a thick cream made by mixing 30 grains of cocaine hydrochloride with $\frac{1}{2}$ drachm of glycerite of starch makes an ideal preparation of that anesthetic.

Another preparation contains 15 grains of arsenic trioxide, 2 grains of cocaine hydrochloride and 1 drachm of glycerite of starch. For gum massage, he recommends a mixture of 20 grains of sodium chloride, 5 drops of oil of lemon and $\frac{1}{2}$ ounce of glycerite of starch.—Brit. Dent. J.; through Pharm. J., 98 (1917), 376.

INFUSA.

Infusion of Digitalis.—*Permanent.*—W. G. Toplis says that there are certain advantages in having on hand at all times a ready-made infusion of this drug and suggests how this can be done

without having the preparation decompose and deteriorate. His plan is to make the infusion according to the U. S. P., but to omit the cinnamon water. The finished infusion is then treated according to the official method for making cinnamon water. In other words the infusion is saturated with oil of cinnamon. A preparation so made was tried out clinically and apparently gave evidence of therapeutic activity.—Proc. Penna. Pharm. Assoc., 40 (1917), 186. (J. K. T.)

Compound Infusion of Senna.—*Preparation of.*—The Dutch Pharmacopœia directs, that compound infusion of senna be prepared with Rochelle salts. T. C. N. Brocksmit found that by use of this salt a precipitate is formed which even after prolonged standing does not settle and cannot be removed by filtration. He therefore recommends using magnesium sulphate and proceeds as follows: Ten parts of whole senna leaves and three parts of crushed anise seed are heated for three quarters of an hour with sufficient water to obtain 80 parts of infusion. In this liquid 10 parts of magnesium sulphate are dissolved, to the solution 10 parts of glycerin are added and after adding 0.1 part of thymol and shaking well the mixture is allowed to stand for three days. It is then filtered and preserved with a crystal of thymol.—Pharm. Weekblad, 54 (1917), 1370. (H. E.)

LINIMENTA.

Camphorated Oil.—*Absorption of Colloidal Camphor from.*—Bordier and Roy find that when camphorated oil is brought in contact with water or with artificial serum a distinct amount of camphor passes into the aqueous medium in colloidal form. Thus 500 mls of artificial serum agitated during 48 hours at 37° with 50 mls of camphorated oil, containing 4.605 grammes of camphor, dissolved 0.635 gramme of the ketone. The authors believe that this explains the method whereby the blood conveys camphor to the heart.—Compt. rend.; through J. pharm. chim., 15 (1917), 397.

Camphorated Oil.—*Made with Liquid Petrolatum.*—As a liquid petrolatum is easier to sterilize than olive oil, certain French pharmacists have substituted the former for it in the preparation of the camphorated oil for subcutaneous injection, with unexpectedly untoward results, since, according to clinical reports,

in several instances the use of such camphorated oil has caused extensive and obdurate indurations. It follows, therefore, that physicians should refrain from prescribing and dispensing chemists from supplying the petroleum preparation for the more assimilable vegetable oil.—*Lancet*; through *Pharm. J.*, 98 (1917), 502.

Lund's Oil.—This preparation is a catheter lubricant which has for many years been used in hospitals and is known as *Oleum Lubricans*. It consists of phenol 1 part, castor oil 4 parts, and almond oil 20 parts (*Lock Hospital Pharmacopœia*), but Squire gives almond oil to 20 parts.—*Chem. and Drug.*; through *Am. Drug.*, 65 (1917,) 61.

Mastisol.—*Substitute for.*—As mastic is very rare, Hauser suggests the following wound dressing: colophony, 300; Venice turpentine, 20; castor oil, 10; benzene, 700; sodium carbonate, 60; essence of pear, 5. Macerate for several days and then filter.—*Schweiz. Apoth. Ztg.*; through *Chem. Abstracts*, 11 (1917), 2944.

Opodeldoc.—*Change in Color.*—Lybing states that the greenish color noted in Swedish opodeldoc is not due to copper but to the reaction between two ingredients of the liniment, thymol and ammonia. He finds that an alcoholic solution of thymol in contact with ammonium hydroxide water turns green after two days; than when the thymol solution is brought in contact with ammonium hydroxide and sodium hydroxide, a reddish yellow to rose-red. Opodeldoc made with oil of thyme does not give the color change.—*Schweiz Apoth. Ztg.*, 55 (1917), 500; through *Chem. Abstracts* (1918).

Wound Dressings.—L. Mencièrè suggests the following recipes for antiseptic wound dressings:

Solution for "embalming" wounds.—Iodoform, guaiacol, eucalyptol, Peru balsam, of each 10 grammes; alcohol, 100 grammes; ether, enough to make 1000 grammes.

Antiseptic pomade.—Iodoform, guaiacol, eucalyptol, Peru balsam, of each 10 grammes; petrolatum, 1000 grammes.

Emulsion for Dressing Wounds.—Tincture of soap bark, (20%) 75 grammes; iodoform, 2.5 grammes; saponin, 2.5 grammes;

guaiacol, eucalyptol, Peru balsam, of each, 10 grammes; water, enough to make 1000 mils.

Antiseptic wash for hands or wounds.—Benzoic acid, 1 gramme; guaiacol, 5 grammes; water, 1000 grammes.—J. pharm. chim., 15 (1917), 52.

LIQUORES.

Solution of Aluminum Subacetate.—*Standard for.*—J. L. Mayer found upon analysis of a commercial specimen of liquor aluminii subacetatis N. F. IV. that it yielded 2.93 per cent. of Al_2O_3 . This being so very much in excess of the N. F. requirements, he interested himself in finding the reason for this. Upon analysis of a sample of the N. F. preparation made very carefully by himself, he was surprised to get practically the same result. Remembering that the N. F. preparation was patterned after the recipe of the German Pharmacopœia, he analyzed a sample of the latter and got practically the same result. All chemicals used in the making of these preparations were first tested to meet pharmacopœial requirements. He suggests that as the Formulary is a legal standard the Revision Committee should take cognizance of this difference of a half per cent. and in the next edition make the necessary changes.—Pract. Drug., Aug., 1917, 29. (J. K. T.)

Burow's Solution.—The Dutch Pharmacopœia states that Burow's solution is a turbid liquid from which a heavy precipitate settles and contains about one per cent. of basic aluminum acetate. It has been the custom of the Dutch druggists to furnish a filtered solution and owing to the above official statement in regard to the strength of the preparation quite a number of druggists have replaced the filtered Burow solution by a one per cent. solution of basic aluminum acetate. This should not be done according to N. Schoorl, because Burow's solution always contains a certain amount of lead sulphate which is soluble to some extent in basic aluminum acetate solution while it is practically insoluble in water. Such a solution is therapeutically distinctly different from a solution of basic aluminum acetate.—Pharm. Weekblad, 54 (1917), 892. (H. E.)

Compound Solution of Cresol.—*Water content of.*—W. W. Davies suggests that since liquor cresolis compositus must meet

the requirements of both the Pharmacopœia and of the Insecticide Act that a method for the determination of water should be included in the U. S. P. as this is needed under the Insecticide Act. He suggests that the following method be used: Measure 100 mls of the compound solution of cresol and 100 mls of xylol into a dry distilling flask. Rotate carefully in order to mix the two liquids and distil through a dry condenser. Collect about 150 mls, or until the distillate is coming over clear, in a dry graduated cylinder. The number of mls of water, the lower layer, gives the percentage of water present.—J. Am. Pharm. Assoc., 6 (1917), 880. (H. H. S.)

Donovan's Solution.—*Apparent Deterioration of.*—Thinking the failure of Donovan's Solution to meet the U. S. P. requirement for arsenous iodide, while meeting that of mercuric iodide, might not be the fault of the chemical used, Joseph Rosen undertook a series of tests which proved that the discrepancy was due to deterioration after the solution was made. The arsenous iodide is gradually oxidized, the maximum rate of oxidation being within a few days after its preparation.

Since the efficiency is due to the arsenic content and probably not the degree of oxidation, the deterioration is only apparent. Tested by the Gooch-Browning method for determination of arsenic, which method first reduces all the arsenic to the arsenous condition, all of the samples used in the first test showed the full amount.—J. Am. Pharm. Assoc., 6 (1917), 951. (Z. M. C.)

Liquor Ferri Mitior et Calcis.—As a substitute for liquor ferri peptonati and Leras' solution (soluble iron phosphate) T. C. N. Brocksmit recommends a preparation which he has named liquor ferri mitior et calcis. It is prepared by diluting 2 grammes of ferric chloride solution with 100 mls of water and stirring into this liquid 0.7 gramme of calcium carbonate. With the evolution of carbonic acid, a dark red colored liquid is obtained which contains about 0.3 per cent. each of iron and calcium. The product is stable at ordinary temperature, but on heating a basic salt separates. It is not changed by sodium bromide and is miscible with iron peptonate solution. It may be rendered palatable by the addition of syrup and spirit of lemon.—Pharm. Weekblad, 54 (1917), 1399. (H. E.)

Hypochlorite Solutions.—In a book by Carrel and Dehelly, entitled "Traitement des Plaies Infectées," is found minute directions for preparing the now famous Carrel-Dakin solution, the original recipe of Dakin, and the improved recipe of Daufresne (see Year Book for 1916, page 73) being given. The article emphasizes the necessity of making the solution not stronger than 0.5 per cent. nor weaker than 0.4 per cent. available chlorine; it points out the difficulty of obtaining chlorinated lime of exactly 25 per cent. strength; it gives the following table showing the amount of ingredients needed according to the strength of the chlorinated lime:

Titration of the chloride of lime (Cl per cent.) (English degrees F.)	Quantities to be Employed for obtaining 10 liters of hypochlorite solution of 0.475 per cent.		
	Chlorinated lime Gm.	Dry sodium carbonate Gm.	Sodium bicarbonate Gm.
20	230	115	96
21	220	110	92
22	210	105	88
23	200	100	84
24	192	96	80
25	184	92	76
26	177	89	72
27	170	85	70
28	164	82	68
29	159	80	66
30	154	77	64
31	148	74	62
32	144	72	60
33	140	70	59
34	135	68	57
35	132	66	55
36	128	64	53
37	124	62	52

The article discusses the chemistry of the solution, quotes the statement of Daufresne, that while a solution, when exposed to light, lost 24.7 per cent. of its chlorine in 30 days, the same solution preserved in darkness lost only 1.4 per cent. of its chlorine in the same period of time.—Am. Dr., 65 (1917), 97.

Hypochlorite Solutions.—John K. Thum in a paper read before the Philadelphia branch of the American Pharmaceutical Association gives a brief history not only of the discovery of Carrel-

Dakin Solution but also of chlorine itself. He then describes the original Dakin Solution and its limitations.—J. Am. Pharm. Assoc., 6 (1917), 458. (H. H. S.)

Hypochlorite Solutions.—Ivor Griffith expresses amazement that there are pharmacists who are unacquainted with the composition of the much discussed Dakin's Solution, and this in view of the fact that so very much has been written about it. Mr. Griffith gives the result of his experience in making this solution and emphasizes the necessity of assaying the chlorinated lime used. He lays particular stress upon the value of the pharmacist of being up-to-the-minute and taking advantage of his opportunities. He says that despite the good things that can be said about the corner druggist, if it were not for the progress made by local, State, and national organizations, which naturally represent the elite of the profession, there would be very little science and professionalism left in the practice of pharmacy as it is practiced to-day. He thinks that because the pharmacopœial requirements for chlorinated lime are 30 per cent. available chlorine the general formula for the Dakin Solution should be based on that percentage. He stresses the point that this solution should be free of caustic alkali.—Proc. Penna. Pharm. Assoc., 40 (1917), 237.

(J. K. T.)

Hypochlorite Solutions.—In a second paper on the Carrel-Dakin Solution, I. Griffith states that the history of use of chlorine and sodium hypochlorite is related and that the perfect surgical germicide is defined as being that which must kill all parasitic life without causing harm to any cell of the living body. After advising the readjustment of recipes to fit the U. S. P. 30 per cent. available chlorine requirement he discusses the assay of the chlorinated lime and of the finished solution, stating as the result of several titrations of this solution, that it deteriorates very slowly when kept in a cool, dark place. A solution assaying 0.149 per cent. sodium hypochlorite on the day of its preparation, at the end of three months' storage only showed a loss of 0.02 per cent. of the active chemical.—Am. J. Pharm., 89 (1917), 497. (I. G.)

Hypochlorite Solutions.—*Disinfection of War Wounds by the Carrel Method.*—The Carrell method of disinfecting wounds is

not a continuous irrigation. Dr. H. H. M. Lyle states that it is not dependent on the miraculous power of an antiseptic, or any one feature of the method, but on the combination of the whole. It is a method of sterilizing wounds by mechanically delivering an antiseptic of definite concentration to every portion of a surgically prepared wound and insuring its constant contact for a prolonged period. The progress of the sterilization is rigorously controlled by the microscope.—J. Am. Med. Assoc., 68 (1917), 110.

(W. A. P.)

Hypochlorite Solutions.—*The Carrel-Dakin Wound Treatment.*—Arthur Dean Bevan holds that the value of the Carrel-Dakin method of treating infected wounds has not been established. He has been forced to the conclusion that Carrel's work does not meet the requirements of scientific research. Bevan believes that the choice of antiseptics in the treatment of infected wounds is of little moment, and that the use of the Carrel-Dakin fluid, like Koch's lymph, Bier's hyperemia and the vaccine therapy of acute infections, will have a short period of popularity.—J. Am. Med. Assoc., 69 (1917), 1727. (W. A. P.)

Hypochlorite Solutions.—*Therapeutic Action of Dakin's Solution.*—Fiessinger and Clogne doubt the great antiseptic action of Dakin's Solution. They believe rather that it acts as a surgical wash, the hypochlorites merely acting as a proteolytic reagent.—J. pharm. chim., 16 (1917), 188.

Hypochlorite Solutions.—*Dakin-Carrel Wound Treatment.*—Wm. H. Welch is convinced that Carrel deserves credit for calling the attention of surgeons to the possibility of the sterilization of infected wounds by chemical means. The Carrel method actually accomplishes sterilization sufficiently for surgical purposes. The destruction of surface bacteria without injury to the body tissues is of primary importance.—J. Am. Med. Assoc., 69 (1917), 1994.

(W. A. P.)

Hypochlorite Solutions.—*Use in Wound Treatment.*—Cazin and Krongold claim that the commercial Eau de Javel diluted 15 in 1000 (then containing 0.427 gramme of sodium hypochlorite in 1000) is less irritating in wound treatment than is Dakin's Solu-

tion, while its bacterial action is even better.—Compt. rend.; through J. pharm. chim., 16 (1917), 352.

Hypochlorite Solution.—*Electrolytic Preparation of.*—Beattie, Lewis and Gee state that a fluid of high bactericidal properties could be produced by the electrolysis of salt water, and it was evident that the main chemical agents produced were hypochlorous acid and sodium hypochlorite. A very simple apparatus suffices for the purpose. It consists of an open glass vessel, such as a museum jar, three-quarters filled with 3 per cent. solution of sodium chloride. Carbon (graphite) electrodes are inserted and connected to the source of electric power, the current previously passing through a resistance. A device for stirring the fluid during the progress of the reaction is advisable, but not absolutely necessary if only small quantities are required. The following measurements have been found suitable for use:

Volume of fluid.....	3½ pints
Height of vessel.....	6 inches
Diameter of vessel.....	7 inches
Electricity.....	1 ampere
Voltage across cell.....	4½ volts
Revolutions of stirrer.....	60 to 80 per minute
Time.....	1½ hours

Clinical experience proves that the bactericidal action of this solution is high, and that it has the advantage over the ordinarily used antiseptics in that it does not coagulate albuminous material and thus form a protecting coagulum. It also has other therapeutic advantages, and, on the technical side, the solution can be produced very simply and at comparatively small cost. The solution will keep if the bottles are full and properly stoppered for a considerable period, but it is an advantage to use freshly prepared material. Brit. Med. J.; through Pharm. J., 98 (1917), 95.

Hypochlorite Solution.—*A Modified Dakin Preparation.*—M. Pozzi suggests for wound irrigation by the Carrel method the following recipe:

Chlorinated lime, 200 grammes; dried sodium carbonate, 100 grammes; sodium bicarbonate, 89 grammes. Place the chlorinated lime with 5 liters of water in a 12-liter flask, shake well several

times, and set aside over night. Dissolve the sodium salts in 5 liters of cold water; add this solution quickly to the chlorinated lime mixture; shake well for a minute, and allow the precipitated calcium carbonate to settle. After half an hour siphon off the clear liquor and filter through paper. The resulting solutions contains about 0.5 per cent. of sodium hypochlorite with small quantities of neutral sodium salts, and is isotonic with the blood serum.—Bull. Acad. Méd.; through Am. Drug., 56 (1917), 61.

Hypochlorite Solutions.—*Sprinkling Apparatus for Applying.*—P. S. Pittenger describes an apparatus which he has devised to hold the Carrel-Dakin solution and convey it in desired quantities at the proper temperature to the wounds undergoing treatment. The illustrations used in the paper show the advantages of the improved apparatus and also the disadvantages in the use of some forms of apparatus now on the market. The temperature of the solution is kept constant by using a vacuum bottle to store the instillating solution.—Am. J. Pharm., 89 (1917), 50.
(I. G.)

Hypochlorite Solutions.—*In Mouth Surgery.*—H. M. Beck reports an investigation and finally the adoption of this solution in all dental surgical cases to the exclusion of all other drugs including iodine.

The Dakin solution properly used is stated to be the ideal antiseptic in the treatment of pyorrhea and in the antiseptic treatment following root amputation.—Am. J. Pharm., 89 (1917), 512.
(I. G.)

Hypochlorites.—*Use in Nasopharyngeal Disinfection.*—While the practical sterilization of infected wounds by means of hypochlorites has been effected, the sterilization of the nose and throat is far more difficult, especially in the case of diphtheria and meningococcus carriers. Encouraging results from the use of a hypochlorite substitute, dichloramine-T, have been reported, but these require confirmation.—J. Am. Med. Assoc., 69 (1917), 651.
(W. A. P.)

Hyclorite.—Into New and Non-Official Remedies has been introduced a commercial form of hypochlorite solution bearing the

name given above. It contains not less than 3.85 per cent. available chlorine. Hyclorite has the action and uses of solution of chlorinated soda, U. S. P., but its available chlorine content is greater. One volume of hyclorite diluted with seven volumes of water has the same available chlorine content as neutral solution of chlorinated soda N. N. R. and is said to be isotonic. The available chlorine content of hyclorite decreases at the rate of about 12 per cent. per annum. In order that allowance for this deterioration may be made in the preparation of dilutions to be used in the irrigation treatment of wounds, each bottle of hyclorite bears the date of bottling.—J. Am. Med. Assoc., 69 (1917), 1081.

(W. A. P.)

Hypochlorite Solutions and Eusol.—A. J. Jones points out that the drawing attention to the difference between the Sodium Hypochlorite solution of Dakin and the Hypochlorous Acid preparation, "Eusol," is very opportune, since there seems to be a tendency to apply the latter name to either of the solutions without recognition of the distinction. While the subject is open, it may be worth while pointing out that "Eusol" does not contain 0.54 per cent. HOCl, as stated, but about half this quantity, namely, something under 0.3 per cent. The attention of the originators of the preparation was drawn to this some time ago, and an acknowledgment appeared in the *British Medical Journal* last year. The point to be observed is that only half of the "available" chlorine as determined in the hypochlorite solution is liberated as hypochlorous acid.—Pharm. J., 98 (1917), 413.

Solution of Hydrogen Dioxide.—*Rapid Gasometric Assay.*—A. Bury finds that the method suggested by him for the assay of hypochlorite solutions (see page 83) applies with equal satisfaction for the assay of dioxide solutions. Into the Bouriez ureometer is poured from 5 to 7 mls of hypochlorite solution, then water is introduced without mixing with the hypochlorite solution, and lastly exactly 2 mls of the dioxide solution is added. As, by the reaction, 1 volume of hydrogen dioxide gives 2 volumes of oxygen, the amount of oxygen in the sample is calculated by dividing the number of mls of generated oxygen by 4.—J. pharm. chim., 15 (1917), 193.

Solution of Magnesium Citrate.—*Rapid Preparation of.*—W. L. Scoville suggests the use of magma of magnesia and a 50 per cent. solution of citric acid for the quick and extemporaneous preparation of solution of magnesium citrate. The formula accompanies the article.—Bull. Pharm., 31 (1917), 262. (C. M. S.)

Solution of Magnesium Citrate.—*Caution Against Explosion.*—The new Pharmacopœia gives as an alternative process the use of sodium bicarbonate "preferably in tablet form" in "charging" solution of magnesium citrate, instead of crystals of potassium bicarbonate.

At a recent meeting of the Baltimore branch of the A. Ph. A. the risk of explosion from the use of sodium bicarbonate in powdered form in this preparation was discussed and a member announced that he had tested it with disastrous results.

Manifestly the tablets only should be used, the liberation of the gas being so rapid with the powder as to put a sudden and explosive strain on the bottle.—Drug. Circ., 61 (1917), 60.

Solution of Magnesium Hypochlorite.—*For Hand Disinfection.*—Dubard finds the use of a solution containing magnesium hypochlorite is preferable to one of calcium hypochlorite alone, since it does not affect the skin to the same degree. One hundred grammes of good chlorinated lime is suspended in 5 or 6 liters of water. After decantation, 250 grammes of magnesium sulphate is added to the clear liquid; or a strong solution may be made using 150 grammes of chlorinated lime, and 180 grammes of magnesium sulphate. After thorough brushing with soap and sterile water, the hands are immersed in either of the above solutions for 5 or 6 minutes. They are then dried in a bath of alcohol, wiped on a sterile cloth and finally thoroughly anointed with the following oil: Sterilized olive or poppy seed oil, 13; essential oil of camphor, 6; essential oil of thyme, sage, or peppermint, 1. This oily preparation renders the hands as absolutely safe bacteriologically as if rubber gloves are worn. Vaseline or soft paraffin is not recommended for use in place of the above oils.—Rep. Pharm.; through Pharm. J., 98 (1917), 9.

Solution of Pituitary Extract.—*U. S. P. Standard for.*—C. R. Eckler comments on the fact that the pharmacopœial standard

for liquor hypophysis is only about one-tenth that of the average commercial pituitary extracts. These extracts have been on the market for several years and have been used by physicians everywhere, who have become familiar with their degree of activity and dosage. It seems advisable to the author that instead of lowering the activity of pituitary extracts to meet the U. S. P. requirement, the latter should be raised to compare favorably with the extracts on the market. The accuracy of the U. S. P. standard is questioned and an apparatus used by the author in the physiological testing of pituitary extract is described.—*Am. J. Pharm.*, 89 (1917), 195. (R. P. F.)

Solution of Potassium Arsenite.—*Deterioration of.*—In a series of experiments made by H. Engelhardt and O. E. Winters, undertaken to find at what rate oxidation of the arsenite takes place, the following conclusions were reached: It is evident that the arsenous acid in Fowler's Solution is oxidized only to a very slight extent when the solution has been properly prepared and has been kept under ordinary conditions. Solutions kept in small containers seem to keep best although that kept in a quart bottle, from which a small amount was removed for testing from time to time, did not deteriorate as rapidly as might have been expected. The color is no indication of the change which the arsenite might have undergone. The result of their investigation is tabulated.—*J. Am. Pharm. Assoc.*, 6 (1917), 134. (L. S.)

Solution of Potassium Arsenite.—*Quality of.*—F. W. Sjöström examined samples of Fowler's solution prepared by various processes: (a) such prepared with carbonates which were strongly alkaline, (b) such made with bicarbonate, and (c) neutral solutions as obtained by the process of the Dutch Pharmacopœia. He found that in solutions prepared with carbonate the arsenic is easily oxidized, while the other solutions remain unchanged for any length of time.—*Pharm. Zeit.*; through *Pharm. Weekblad*, 54 (1917), 1149. (H. E.)

Ringer-Locke Solution.—*Use in Hemorrhages.*—This liquid is highly recommended by Lambert and Barnsley for intravenous injection in cases of serious hemorrhages. It may be employed

in almost all the cases in which the transfusion of blood is resorted to. Its composition is as follows:

Sodium chloride.....	9.0 Gms.
Potassium chloride.....	0.42 Gm.
Calcium chloride.....	0.24 Gm.
Sodium bicarbonate.....	0.15 Gm.
Distilled water.....	1000.0 Gms.

It is said to be much superior to injections of physiological solution (7 or 9 per 1,000), which the authors regard as toxic to the heart; it is the most certain means of averting paralysis of the heart in serious hemorrhages. In cases of very serious hemorrhages from war wounds, patients treated with this liquid have recovered very rapidly.—*Rev. Higiene y. Sanidad. Vet.*; through *Pharm. J.*, 98 (1917), 274.

Solution of Sodium Hypobromite.—*Extemporaneous Preparation.*—In order to obviate the inconvenience of handling liquid bromine, which, moreover, is sometimes difficult to obtain at the present time, A. Fouchet advocates the use of the two following solutions: Solution A—Sodium bromide, 42 grammes; sodium chlorate, 8.5 grammes; distilled water to make 100 mls. Dissolve with heat. Solution B—Hydrochloric acid, sp. gr. 1.171, 50 grammes; distilled water to make 50 mls. To prepare the reagent, heat 30 mls of A to boiling in a 300 ml flask; withdraw from the heat; add 25 mls of Solution B, and at once cool down the mixture in a current of cold water. To the solution of bromine thus obtained add 25 mls of caustic soda solution, sp. gr. 1.332, still keeping the flask immersed in the stream of cold water. An alternative is to use commercial saturated solution of sodium hypochlorite, potassium bromide, and hydrochloric acid; but the variability in strength of the hypochlorite solution, and the impurities it may contain, render the first given method much preferable.—*J. pharm. chim.*; through *Pharm. J.*, 98 (1917), 65.

Solution of Sodium Hypochlorite.—*Electric Process.*—This can readily be prepared by the electrolysis of a 4 per cent. solution of salt in water. With the expenditure of 10 amperes direct current at 220 volts twelve gallons of the hypochloride solution are produced per hour. This will contain about 2 per cent. of chlorine.

For disinfecting purposes the stock solution can be diluted with 9 volumes of water. Such a dilution can also be used in laundries to destroy micro-organisms and to remove stains, without appreciably injuring the fabrics.—*Sc. Am. Suppl.*, July 7, 1917, 3. (O. R.)

Solution of Sodium Hypochlorite.—*Effect of Manganese Salts on Keeping Quality.*—Vanderkleed and E'we state that the pink color sometimes developed when commercial calcium hypochlorite is used in the making of solution of sodium hypochlorite, is due to traces of manganese salts in the calcium hypochlorite which become oxidized to permanganate and thus give the solution a pink color. They give a series of assays of hypochlorite solutions, colored and uncolored, and show conclusively that the pink-colored solutions deteriorate very rapidly.—*Proc. Penna. Pharm. Assoc.*, 40 (1917), 234. (J. K. T.)

LOTIONES.

Almond Cream.—*Recipe for.*—J. A. Arkin seems to have solved the problem of preparing a really worth-while almond cream. He says that the following yields a permanent preparation:

White wax.....	60.0 grammes
Potassium hydroxide.....	10.0 grammes
Powdered borax.....	1.5 grammes
Starch.....	30.0 grammes
Glycerin.....	60.0 mls
Alcohol.....	70.0 mls
Oil of bitter almonds.....	4.0 mls
Distilled water to make.....	1000.0 mls

The starch is boiled with 150 mls of water until a jelly is obtained. The potassium hydroxide is dissolved in 300 mls of boiling water, the wax is added to this and the heat continued until saponification has taken place; the powdered borax is now added and the heat continued a moment longer.

Then stir well with an egg-beater and add mixture to the starch jelly, which should be at the same temperature, and continue applying the heat until a uniform mixture results. Strain through gauze, add glycerin, and shake vigorously. The bitter almond oil, previously dissolved in the alcohol, is then added, and lastly sufficient distilled water to make the required volume. Shake well and bottle.

The author advises that the corks should be paraffined, as the corks as ordinarily used soon acquire a brownish discoloration which in turn may render the cream unsightly.—*Drug. Circ.*, 6 (1917), 243. (J. K. T.)

MAGMÆ.

Magma of Magnesia.—*Criticisms and Suggestions.*—Sister Bertha Mueller says that so far most of the formulæ advanced for making this popular preparation have been only partly satisfactory. She finds that a nice magma can be made by somewhat modifying the N. F. III formula. This is done by substituting dried magnesium sulphate for the ordinary crystalline sulphate. By doing this, one obtains a magma that subsides readily and is easily washed and, what is equally important, one that is readily "pourable." Nothing can be more exasperating to either the pharmacist of the patient than to get a milk of magnesia that is thick and tenacious and refuses to allow itself to be poured from one bottle to another.

The formula recommended is as follows:

Magnesium sulphate dried.....	270.0
Sodium hydroxide, U. S. P.....	120.0
Distilled water to make.....	1000.0

Dissolve the dried magnesium sulphate in enough distilled water to make 750 mls and filter; dissolve the sodium hydroxide in enough distilled water to make 250 mls and likewise filter. Now pour the solution of sodium hydroxide into the solution of dried magnesium sulphate, mix well and bring the mixture up to 4000 mls. Wash the magma by decantation, bringing the volume up to 4000 mls each time. Continue the washing until the supernatant liquor, when tested by barium chloride test solution, shows no more than traces of sulphate. Assayed by the official method, the magma will show not less than 6.5 per cent. nor more than 7.5 per cent. of magnesium hydroxide.—*Proc. Penna. Pharm. Assoc.*, 40 (1917), 142. (J. K. T.)

MASSÆ.

Mass of Mercury.—*Detection of Rose Leaves in.*—European pharmacopœias direct the use of rose leaves in making blue mass. W. Partridge finds that the acetic acid test of Dechan and Maben (*Pharm. J.*, 1884) for the identification of rose leaves is defective.

He prefers the microscopic test, boiling a portion of the pill in water when the greater part of the mercury subsides almost immediately. The supernatant liquid, which contains the floating vegetable elements, may then be decanted. After a second subsidence the deposit from this may be collected and examined. The micro-characters of rose petals are very distinctive, and the red color contained in chromoplastids shows up well. In mass which has been made for some time this color is seen to be brown instead of red. Analyst; through Pharm. J., 98 (1917), 295.

MUCILAGINES.

Mucilage of Sassafras Pith.—J. C. and Bertha L. deG. Peacock report their work toward improving the process for making this preparation, particularly in reducing the time required. It should be freshly prepared, and when called for is needed for immediate application and usually for an eye injury. The directions in the N. F. IV read "Macerate the pith in the water during three hours, and strain without expression." In their opinion a preparation with the same amount of viscosity can be made in 10 minutes time if the pharmacist will subject the mixture to constant agitation. They also found that the present formula is inadequate in that it does not make the amount called for. It will be remembered that the text says: "Sassafras. Pith 2 grammes, Water 100 mls; to make about 100 mls." As the pith retained at least 20 per cent. of the water in all their experiments, they advise that the text of the present official formula be changed as follows:

MUCILAGO SASSAFRAS MEDULLÆ.

Mucilage of Sassafras Pith.

Sassafras pith.....	3.0 grammes
Cold Sterile Water.....	150.0 mls

To make at least one hundred millimeters. Place the sassafras pith in the water and stir constantly during ten minutes, then filter through a thick pledget of wet cotton. This preparation should be freshly made when wanted.—Proc. Penna. Pharm. Assoc., 40 (1917), 171. (J. K. T.)

PASTÆ.

- * **Bismuth Paste.**—*Toxicity of.*—Dr. Ellis B. Freilich, reports a case of poisoning following bismuth paste injection. He states

that 64 poisoning have been reported previously. J. Am. Med. Assoc., 68 (1917), 111. (W. A. P.)

Bismuth Paste.—*Toxicity of.*—Major Hepworth reports five cases of poisoning due to bismuth and iodoform paste ("Bipp Paste") applied according to Monson's technique. While lead poisoning was suspected, Oliver's statement that the administration of bismuth salts gives symptoms akin to plumbism has caused the presumption that the toxic symptoms were due to bismuth. Unfortunately none of the bismuth used was tested for lead. The article closes with a test for lead in bismuth salts.—Lancet; through Pharm. J., 98 (1917), 343.

PILULÆ.

Pills.—*Disintegration of.*—Wm. Maske reports the results of two series of experiments to determine the rate of disintegration of a variety of pill masses. Granting that mechanical digestion differs from what goes on in the body probably the ratios of the time of disintegration by mechanical means are not much different from the time of disintegration by real digestion.

In the first experiment the pills were immersed in an aqueous solution containing 0.3 per cent. pepsin and 0.5 per cent. hydrochloric acid at a temperature of 37° C. The pills were all blanks of the same size and age. Observations were made every 15 minutes and, of 28 different combinations tested, a soft mass pill of 1 part glycyrrhiza and 1 part manna with enough glycerin had disintegrated in 15 minutes and one of kaolin and petrolatum was intact at the end of 3 hours.

In the second experiment an apparatus was arranged to give mechanical motion to an artificial gastric juice kept at body temperature. The pills used were 6 weeks old and an average of four trials with each pill was taken. No enteric pill was found which had not lost its coating in 1½ hours. In this test a combination of starch with syrup of glucose disintegrated in 4 minutes and the kaolin-petrolatum combination had not disintegrated in 8 hours. The author gives two tables showing the results of his work, both of which are deserving of careful study.—J. Am. Pharm. Assoc., 6 (1917), 1059. (Z. M. C.)

Soft Mass Pills.—*Manna as an Excipient for.*—In experimenting with manna as a general pill excipient, Wm. Maske found two excellent combinations for soft mass pills.

“Formula I—Manna 1 part, glycyrrhiza 1 part, glycerin, q. s.

Formula II—Manna 2 parts, yellow dextrin 5 parts, glycerin q. s.”

After being kept a year in ordinary pasteboard pill boxes, the “pills can be squeezed up and re-rolled as readily as the day on which they were first made.” He found that both of these disintegrated much sooner than the proprietary ones. The “elbow-grease” required in grinding the manna with the diluent is the one difficulty.—J. Am. Pharm. Assoc., 6 (1917), 1058. (Z. M. C.)

Pills.—*Quantity of Active Material in.*—Gronberg reports experiments in which sugar was triturated (a) with citric, oxalic and tartaric acid; or (b) with calcium carbonate or sodium carbonate; or (c) with sodium chloride or phosphate or sulphate. The triturated material was divided either into pills or powders and the individual doses were dissolved in water and titrated with (a) tenth-normal alkali, (b) with tenth-normal acid and (c) with tenth-normal silver nitrate. The results showed that accuracy of dosage depended on amount of powder and time of trituration; 20 pills showed a greater accuracy than did 50 or 100; 10 powders were much more accurate than 20 or 30; five minutes’ trituration placed in each powder a nearly accurate amount of active substance, while one minute’s trituration gave variable results.—Schweiz. Apoth. Ztg.; through Chem. Abstracts, 11 (1917), 2019.

Blaud’s Pills.—*History and Preparation.*—According to P. E. Lundin, Blaud presented his formula for his iron pills to “l’Académie royale de Médecine” in 1831. The subsequent history of these pills is given, with a bibliography and the pharmacopœial directions from 17 nations. Several non-official preparations are also included. There is a detailed discussion of the tests and assays of the salient constituents. It is concluded: “The pills should contain the iron as preformed FeCO_3 . The pills should be prepared with addition of water. The ferrous sulphate and alkali ought to be present in almost exactly equivalent amounts. Crystallized ferrous sulphate should be used. Certain advantages are derived by using bicarbonate in place of carbonate. Glycerin ought to be present. The following ought to be absent: althea root, tragacanth, gum arabic, magnesium oxide. The conservation agent ought to be a sugar more reducing than cane sugar.”—

Svensk. Farm. Tidskrift.; through Chem. Abstracts, 11 (1917), 2261.

PULVERES.

"**Pulv. Einhorn.**"—H. MacG. King states that in the vicinity of New York, prescriptions for "Pulv. Einhorn" are prepared by the following recipe:

Magnesia calc.....	℥ss
Natrium bicarb.....	℥ss
Oleo-Sacch Menth. Pip. (Pharm. Germ.).....	℥ii

Misce et fiat in Pulv. et disp. in Scatula.

Sig.: ℥i in water t. i. d.

—Am. Drug., 65 (1917), 157.

SAPONES.

Soap Bubbles.—*Longevity.*—James Dewar says that in pure air, free from suspended particles of organic and inorganic refuse, and protected from vibrations soap bubbles may be preserved indefinitely, he having one a year old and still intact.—Chem. & Drug., 89 (1917), 109. (K. S. B.)

Soap.—*As Wound Dressing.*—Ratynski discusses the use of white Marseilles soap (practically the same as white Castile soap) as a dressing for large anfractuous wounds caused by shells. For lavages and irrigations a solution of 1 in 40 should be used; for the impregnation of compresses 1 in 20. The solution is prepared by dissolving shreds of the soap in tepid boiled or distilled water. The wound is first thoroughly cleansed with pledgets of sterilized gauze steeped in the solution, is next freely irrigated with soapy water, and afterwards a sort of embalming with soap is carried out. This is effected by means of multiple-layered compresses of gauze super-saturated with soap. Previous to application these compresses are so manipulated that an abundant light froth is raised in the interstices of the gauze, thus forming a tissue which gives the dressing porous properties similar to those of a sponge. This is spread over the surface of the wound and lightly pressed; but the dressing should never be less than 1 Cm. in thickness. A thickish layer of cotton-wool, with a tarlatan bandage completes the dressing, which should be renewed every two or three days. Under the use of the dressing there is immediate relief from or

cessation of pain, and wounds heal with remarkable rapidity with favorable cicatrization without retraction or induration.—Brit. Med. J.; through Pharm. J., 98 (1917), 175.

Surgical Soaps.—*Requirements for.*—R. Lecoq states that the four necessary conditions for a good surgical soap are: (1) It must be neutral. (2) Glycerol is necessary to produce the desired unctuousness. (3) It must be capable of sterilization. (4) It should be economical. The best soaps are the potash soaps of oils. The oils should be tested for (1) index of saponification, (2) preparation of "starter," (3) actual preparation of soap with a titrated quantity of potash.—Bull. sci. pharmacology, through Chem. Abstracts, 11 (1917), 3376.

SPIRITUS.

Spirit of Nitrous Ether.—*Preservation.*—T. C. N. Brocksmit found that spirit of nitrous ether which has become acid on keeping contains both nitrous and nitric acid, which, however, can easily be eliminated by shaking the spirit with magnesium carbonate. He therefore recommends keeping spirit of nitrous ether in the cellar or any other cool place in a container partly filled with magnesium carbonate, decanting when needed the clear solution and keeping this in a bottle containing crystals of sodium sulphite. By adding the sulphite, spirit of nitrous ether, even on prolonged keeping in a partly filled bottle does not deteriorate.—Pharm. Weekblad, 54 (1917), 1052. (H. E.)

SYRUPI.

A New Digestant.—After outlining in detail the chemical reactions which take place during the digestion of different kinds of foods, W. A. Konantz offers the following formula for a scientific digestant:

Pepsin.....	40.000 Gm.
Diastase.....	40.000 Gm.
Dilute hydrochloric acid.....	50.000 mls
Sodium phosphate.....	8.25 Gm.
Purified oleic acid.....	30.000 mls
Alcohol.....	50.000 mls
Strychnine sulphate.....	0.175 Gm.
Oil of bitter almonds.....	3.750 mls
Tincture of cudbear.....	60.000 mls
Kaolin.....	15.000 Gm.
Syrup, sufficient to make.....	1000.000 mls

Dissolve the sodium phosphate in the hydrochloric acid and mix the solution with 725 mls. of syrup. In this dissolve the pepsin and diastase, triturate with kaolin and filter. Dissolve the strychnine sulphate in about 25 mls of syrup; the purified oleic acid and oil of bitter almonds in the alcohol. Add the solutions to the pepsin solution previously prepared, then add the tincture of cudbear and filter the liquid adding through the filter sufficient syrup to make it measure 1000 mls.

The paper explains the reason why oleic acid, sodium phosphate and strychnine are among the ingredients. The dose is intended to be about two fluidrachms. The finished product which will be of cherry-red color and cherry flavor should be kept in well-stoppered containers preferably sealed with paraffin.—J. Am. Pharm. Assoc., 6 (1917), 243. (L. S.)

Syrups.—*Comparison of Sweetening Power with Saccharin Solutions.*—H. Helch prepared the following saccharin solutions: (a) 1.41 grammes of saccharin (sweetening power 440) to a kilo of water; (b) 1.128 grammes of saccharin (sweetening power 550) to 1 kilo of water; (c) 1.5 grammes of saccharin (440) to 1 kilo of water; (d) 1.2 grammes of saccharin (550) to 1 kilo of water. He found that 1 gramme of "a" or of "b" is equivalent to 1 gramme of syrup sp. gr. 1.30; that 1 gramme of "c" or of "d" is equivalent to 1 gramme of syrup, sp. gr. 1.33; that 1 gramme of sugar is equivalent to 1.61 grammes of "a" or "b" and to 1.51 grammes of "c" or "d."—Pharm. Post; through Chem. Abstracts, 11 (1917), 2532.

Molasses.—*Use in Pharmacy.*—In view of the great scarcity of sugar for pharmaceutical purposes in England, F. Goldby experimented with "golden syrup" sold in the grocery stores of that country. He found that when it was diluted with water (using about 25 per cent. more of the molasses than the official amount of sugar) he obtained a syrup of orange-yellow color but of marked molasses flavor. This flavor prevents its use in syrups of delicate aroma but for such syrups as those of senna, rhubarb and poppy capsules it is well adapted. The paper points out the absurdity of the action of the English Food Director in shutting off the supply of sugar for pharmacists, while allowing enormous quantities to be used for confectionery.—Pharm. J., 98 (1917), 85.

Syrup of Iodotannin.—*Fluidextract for its Manufacture.*—Manséau makes up a stock mixture as follows: 200 grammes of tincture of iodine (F. Codex), are mixed with 40 grammes of tannic acid, 360 grammes of glycerin and 400 grammes of syrup, let stand for one month. To prepare the syrup, 100 grammes of the mixture is diluted with 900 grammes of syrup. Since the glycerin retards the interaction between the tannic acid and the iodine, 760 grammes of syrup may be used to replace the amounts of glycerin and of syrup given above.—*Repert. pharm.*, 28 (1917), 261; through *Chem. Abstracts* (1918).

TABLETTÆ.

Rhinitis Tablets.—*Assay of.*—R. Miller weighs 100 tablets, powders 11 and takes of the powder the weight representing 10 tablets, mixes with sand, extracts with ether, evaporates the ethereal filtrate—first at about 60° and latterly spontaneously. The dry residue is weighed in a tared dish, after which it is heated until all of the camphor has evaporated. The loss of weight on heating is reported as camphor. The powder remaining after ethereal extraction is extracted with a mixture of chloroform and absolute alcohol, the filtrate is evaporated and the residue is weighed as anhydrous quinine sulphate. The fluidextract of belladonna is detected by its mydriatic effect on the eye of a cat.—*Am. J. Pharm.*, 89 (1917), 214.

Salol and Quinine Tablets.—*Assay of.*—R. Miller weighs 25 tablets, powders them, weighs out a portion of the powder representing one tablet, mixes with sand and extracts with petroleum ether. The petroleum ether extract is evaporated first on a water-bath and latterly spontaneously and the dried residue is weighed as salol. The powder left after extraction with petroleum ether is then extracted with a mixture of chloroform and absolute alcohol, the filtrate is evaporated and the dried residue is weighed as anhydrous quinine sulphate.

Of course in the analysis of these and rhinitis tablets, the individual ingredients after extraction and weighing must be identified by the usual tests.—*Am. J. Pharm.*, 89 (1917), 215.

TINCTURÆ.

Tincture of Cantharides.—W. L. Scoville summarizes the findings of three previous papers on this subject. A better solvent than alcohol is necessary, either alone or with it, because alcohol *does not* extract cantharides even to saturation and *cannot* because of the slight solubility of cantharidin in it and because of the high percentage of cantharidin in some of the cantharides on the market. Extraction with any solvent is difficult and digestion especially with hot water aids extraction.

The present paper reports the results of extraction by means of a Soxhlet apparatus with a menstruum of 150 mls of acetic ether and 5 mls of glacial acetic acid for 100 Gm. of drug, the extraction continuing until a few drops yielded no residue on spontaneous evaporation. Twelve to eighteen hours were required in most cases, depending on the fineness of the drug. After adjusting the volume of extract to 150 mls, alcohol was added to make 1000 mls and after 24 hours it was filtered. The finished tincture represented 10 per cent. of the drug in an alcoholic menstruum containing 15 per cent. acetic ether and 0.5 per cent. acetic acid, by volume. Three specimens from drugs containing respectively 10.8 per cent., 0.9 per cent., and 0.75 per cent. of cantharidin assayed 0.090 per cent., 0.084 per cent. and 0.071 per cent., representing in turn 83 per cent., 93 per cent., and 95 per cent. of the drug used.

The conclusions are that the drug should be either slowly percolated with 10 volumes of acetic acid and 90 volumes of alcohol, or should be extracted with ethyl acetate and acetic acid as outlined above.—J. Am. Pharm. Assoc., 6 (1917), 798. (Z. M. C.)

Tincture of Cinchona.—*Assay of.*—F. Hebeisen evaporates 50 mls of the tincture until 10 grammes of residue are obtained. This is mixed with 5 mls of diluted hydrochloric acid and after the addition of 4 grammes of 15 per cent. caustic soda solution, the mixture is shaken with 50 grammes of ether and 25 grammes of chloroform. Three grammes of tragacanth are then added, the mixture is shaken violently, allowed to stand for five minutes and 50 grammes of the clear solution are filtered through fat-free cotton into a flask and evaporated. The residue is treated three times with each 5 mls of ether which is evaporated each time. It is then dissolved in 10 mls of absolute alcohol, the solution is mixed

with 10 mls of water, and 3 drops of hematoxylin solution and titrated with N/10 acid until a red-brown color is produced. It is then diluted with 30 mls of water and the titration is continued until the liquid has acquired a lemon-yellow color.—Apoth. Zeit.; through Pharm. Weekblad, 54 (1917), 1175. (H. E.)

Compound Tincture of Cinchona.—*Preparation of.*—T. D. McElhenie suggests the addition of 1 per cent. of hydrochloric acid to the menstruum for compound tincture of cinchona to prevent the usual precipitation in this preparation. The author exhibited a sample of old tincture which had been clarified by the addition of above amount of acid.—Proc. N. J. Pharm. Assoc., 47 (1917), 61. (J. H.)

Tincture of Iodine.—*Use in Erysipelas.*—W. Keppler states that a 10 per cent. tincture of iodine generally has a prompt and certain curative action on erysipelas. During the author's period of service throughout the war he has met with only one case of erysipelas. It is suggested that the prevailing use of tincture of iodine as a first antiseptic dressing for wounds is responsible for this rarity of erysipelas.—Med. Klin.; through Pharm. J., 98 (1917), 275.

Tincture of Larkspur.—*Quality in New York.*—H. V. Army points out that a dozen samples of tincture of larkspur purchased in New York drug stores had an alcoholic content ranging from 11.8 to 70.5 per cent. He emphasizes the fact that the new Natural Formulary gives a recipe for this preparation, which must now be prepared with strong alcohol. Those prepared from acetic fluid-extracts are no longer legal.—Proc. N. Y. S. Pharm. Assoc., 39 (1917), 248.

Tincture of Vanilla.—*Quality in Canada.*—A. McGill states that of 125 samples of commercial "extract of vanilla" examined by him, 53 samples were found to be genuine, 54 sold as artificial, etc., 12 adjudged as adulterated, and 3 as doubtful. Mr. McGill's report contained the following comment: "*The depth of color of an honestly made extract of vanilla is a fairly good index to its strength; in other words, to the amount of actual bean material used in its prepara-*

tion." In pointing out that alcohol is necessary in extract of vanilla in order to get the characteristic resins in solution, the report states. "For this reason an extract cannot meet the requirements of a true vanilla bean extract unless it contains from 30 to 40 per cent. of alcohol."—Pract. Drug., Dec. 1917, 40.

UNGUENTA.

Ointments.—At the meeting of the Florida association H. Russell after discussing the need from the therapeutic standpoint of selecting the proper ointment base dependent upon whether absorption, semi-absorption or non-absorption be desired, cites methods for the preparation of the following ointments: Camphor and chloral, thymol iodide, ammoniated mercury and compound resorcinol. In the latter case the author recommends the following method in which he employs anhydrous wool fat and water in place of the hydrous wool fat:

To the water contained in a suitable mortar and in which the resorcin has been previously dissolved, add first the zinc oxide and rub well until a perfectly smooth mixture is obtained; then add the bismuth subnitrate and rub until smooth. To this add the anhydrous wool fat and emulsify well; melt the paraffin separately and to this add the petrolatum, stirring until congealed, mix the two ointments, and finally incorporate the oil of cade. Put up immediately in small jars, or, preferably, collapsible tubes to protect from the light.—Drug. Circ., 61 (1917), 242. (J. H.)

Ointment Base.—*Hydrogenated oil as.*—W. M. Linnett Jr. finds hydrogenated oil an ideal ointment base, being a good carrier, quickly absorbed, practically non-rancid, and economical. Simple ointment may be prepared from it by using half the wax that lard requires. Ointments of belladonna, stramonium, tannic acid, chrysarobin, nutgall, iodine and sulphur made from it are of very fine quality. In making ointments of tar and phenol it gave good results. For zinc ointment, the addition of 5 per cent. of castor oil was found necessary. The writer also prepared a satisfactory *cold cream* from white wax, 1 pound; cottonseed oil 1 1/2 pints; hydrogenated oil, 4 pounds; water, 2 1/4 pints; borax, 1 ounce; tincture of benzoin, 1 ounce; perfume to suit, 50 grains to the pound of finished material.—Pract. Drug., Feb. 1917, 34.

Ointment Bases.—Bedall states that lard may be replaced by a mixture of equal parts of paraffin and wool fat, or preferably by a mixture prepared by melting together 200 parts of solid paraffin, 800 parts of liquid petrolatum and 1000 parts of wool fat and incorporating into the mixture, after cooling, 400 parts of water.—Apoth. Ztg.; through Drug. Circ., 61 (1917), 76.

Ammoniated Mercury Ointment.—*Cause of Yellowing.*—The yellowness of ammoniated mercury ointment is due to the decomposing effect of benzoic acid upon the ammoniated mercury, says Henry Stout. He therefore opposes use of benzoinated lard as a base for this ointment.—Chem. and Drug, 89 (1917), 202. (K. S. B.)

Brilliant Green Ointment.—*Use as Epithelial Stimulant.*—R. W. Hodgson Jones states that a one or two per cent. ointment made by dissolving brilliant green in a small volume of alcohol and incorporating the solution with petrolatum, has been found to be a most useful application for superficial wounds, impetigo, indolent ulcers and similar lesions. The ointment is non-irritant, antiseptic, and possesses powerful auxetic properties. After one or two applications itching is diminished, new growth is apparent, and healing rapidly proceeds. Although the ointment appears to be non-toxic in any strength, when applied stronger than 5 : 100 it occasions severe smarting. No advantage seems to follow the use of a stronger application than 2 : 100.—Brit. Med. J.; through Pharm J., 98 (1917), 337.

Iodine Ointments.—An examination of iodine ointments made in the A. M. A. Chemical Laboratory by L. E. Warren demonstrated that when made according to the method of the U. S. Pharmacopœia (dissolving iodine in potassium iodide and glycerin and then incorporating with benzoinated lard), about 20 per cent. of the free iodine used combines with the ointment base. On standing for a month a further quantity of 5 per cent. goes into combination, and after this no further loss of iodine occurs. The composition of iodine ointment, U. S. P., after a month or more is approximately: free iodine, 3 per cent.; iodine combined with fat, 1 per cent.; potassium iodide, 4 per cent.; benzoated lard (containing combined iodine) 80 per cent. The U. S. Pharmacopœia requirement that iodine ointment shall be freshly prepared appears to be

unnecessary. It was also found that if iodine is made without the addition of potassium iodide, practically all of the free iodine enters into combination with the fat.—*Am. J. Pharm.*, 89 (1917), 339. (W. A. P.)

Ointment of Rose Water.—In view of the fact that the official ointment of rose water is usually prescribed in England, combined with other medicaments, George Elliot suggests the omission of borax from the recipe, leaving however, the water content at 20 per cent. The ointment of the British Pharmacopœia gives a distinctly alkaline reaction with litmus, despite the fact that ointment bases should be neutral. This ointment then forms compounds with the different medicaments such as, sodium salicylate with salicylic acid; free ammonia is given off, even in the cold, when borax is mixed with ammoniated mercury; calomel with borax gives the black mercurous oxide and the oleate of mercury acts similarly, giving a very dark ointment. No doubt, physicians forget the new ointment base contains this borax, which will react with many medicaments.—*Pharm. J.*, 99 (1917), 283. (M. O'C. D.)

Tar Ointment.—*Incompatibility with Zinc Oxide.*—Tar ointment forms a hard mass, resembling Burgundy pitch, when mixed with zinc oxide, says George Elliot.—*Chem. and Drug.*, 89 (1917), 1060. (K. S. B.)

Zinc Ointment.—*Easy Preparation of.*—R. A. Austin recommends a mode of preparing this ointment which seems to save time and avoids the drudgery of cleaning greasy utensils. Over the open end of a cylindrical vessel two layers of cheese-cloth are tied in a manner to leave it sagging in the middle, in this depression the powdered zinc oxide is placed; the benzoinated lard is then heated to 135° F., and gradually poured over the strainer, and the mixture stirred with a spatula to force through the zinc oxide. The whole procedure requires but a few minutes' time and the result is a nice smooth ointment.—*Drug. Circ.*, 61 (1917), 243. (J. K. T.)

VINI.

Medicinal Wines.—*Russian Definition.*—A decree by the Russian Minister of the Interior defines medicated wines as being wines which, in addition to the usual component parts of wine,

contain medicaments in solution in such quantity that the average therapeutic dose should not contain over 10 grammes of alcohol.—Chem. and Drug., 89 (1917), 17. (K. S. B.)

D—NEW REMEDIES AND TRADE-NAMED PREPARATIONS.

NOTE.—The paragraphs in this chapter having journal references in parentheses are taken from the Report of the Committee on New Remedies published in the Proceedings of the New York Pharmaceutical Association 1917, pages 195 to 214.

A-189 is a new synthetic discovered by Dr. Simon P. Flexner of the Rockefeller Institute after collaborative experiments, dating from the outbreak of the world war. In announcing the discovery, Dr. Flexner explained that it was sought for because of the danger attendant upon the injection of salvarsan, or "606," and owing to the fact that the war had made it virtually unobtainable in the United States. The new drug, an organic arsenical compound, can be prepared in this country at a nominal cost of five cents a dose wholesale, whereas the price of salvarsan is almost prohibitive. But the most important feature of the new discovery is the fact that it develops greater resistance for the spirochetal infection without doing as much damage to the cells of the body.—Pharm. Era, 50 (1917), 386.

Abetol Pills, advertised as a remedy for rheumatism, contain sodium salicylate. (D. C.)

Aboe Akoe, an African Fever Remedy, consists of seeds which E. M. Holmes has identified as being the seed of *Picralima Klaineana*. The seeds were brought to England by persons who had traveled in Africa and who had observed the remarkable cures effected by the use of the seeds by the natives. (Am. Drug.)

Adjuvans is the name given to a lotion containing a mercurial salt marketed by the Kripke Chemical Firm in Holland. (Am. Drug.)

Agasol is the trade name of a highly purified and completely soluble agar-agar. It is used solely as a culture medium, being

considered too thoroughly purified for other purposes where a cruder product answers just as well. (Am. Drug.)

Akoz is a mineral product said to possess most remarkable medicinal properties. The method of administration is to shake water with the mineral, allow the insoluble material to subside and to drink the supernatant liquid. A case of lead poisoning from the use of Akoz was suspected. Analysis gave 2.27 per cent. of lead sulphate.—Rep. Lab. Am. Med. Assoc.; through Chem. Abstracts, 11 (1917), 2023.

Alarin is an insecticidal and bactericidal application marketed in pencil form and consists in insecticidal drug principles incorporated in a superfatted soap. (Am. Drug.)

Alboral is a permanent solution of aluminum monoboroacetate ($\text{Al}(\text{O}.\text{CH}_3\text{CO})_2\text{BO}_2$), recommended as a general external antiseptic possessing at the same time a mildly astringent effect. The William S. Merrell Chemical Company, Cincinnati, market this specialty. (Am. Drug.)

Alcopton is a substitute for pantopon, the narcotic preparation supposed to contain all the alkaloids of opium. According to the *Apotheker Zeitung*, it is extensively used in central Europe. (Am. Drug.)

Anasarcin and Anedemin are exploited as heart remedies. Anedemin is said to consist of apocynum, strophanthus and squill with elder—an irrational mixture of three heart drugs with inert elder. Anasarcin has been stated to contain sourwood, elder and squill. Anasarcin is a dangerous remedy in the hands of the average clinician, and its use is at all times to be condemned.—J. Am. Med. Assoc., 69 (1917), 1992. (W. A. P.)

Antalgin, marketed by Zanoni, of Milan, is an antipyretic remedy representing a mixture of some of the coal-tar derivatives with caffeine or theobromine. It is recommended specifically in the treatment of sciatica. (Am. Drug.)

Antiarthryl, according to K. Halbey, is a 50 per cent solution of melubrin and is used for intravenous treatment of muscular rheumatism. (Chem. Abstracts.)

Antihoechst is a Dutch whooping cough remedy consisting mainly of a fluidextract of thymus lauri with other sedative drugs. It is marketed by Koper & Co., Amsterdam, Holland. (Am. Drug.)

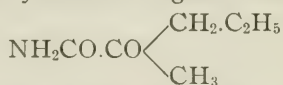
Antipyrezine-tuberculine is prepared in pill form from a base of hydropyrene and arsenous oxide; its use is recommended for the fever and toxemia of tuberculosis. (Chem. Abstracts.)

Antox, according to the chemists of the American Medical Association is a red syrupy liquid (Sp. Gr. 1.0603) containing ammonium chloride, hydrochloric acid, sulphurous acid, sulphuric acid and invert sugar. (Chem. Abstracts.)

Anuresin, a new remedy indicated in the treatment of anuresis is supplied in ampuls by the Zanoni firm of Milan. Its exact composition is unknown. (Am. Drug.)

Apectina is an Italian specialty the composition of which is not definitely known. It is marketed by Zambeletti, Milan, and is recommended as a mild antiseptic in the treatment of infantile gastric disturbances, being especially recommended as an aid in the digestion of milk. (Am. Drug.)

Aponal is a hypnotic remedy obtained by interaction of urea hydrochloride with amylene and is given the following formula:



It occurs as colorless crystals melting at 83° to 86° difficultly soluble in water but as easily soluble in the immiscible solvents. According to Dr. Simonstein it exhibits its somnifacient qualities best when administered in conjunction with caffeine or theobromine and is therefore often prescribed dissolved in tea or coffee. (Am. Drug.)

Aposthesine is a synthetic anesthetic resembling in a general way stovaine and particularly novocaine. Chemically it is the

hydrochloride of gamma-diethylamino-propylcinnamate. It is produced in the form of small white crystals, having a melting point of 137° C. It is readily soluble in alcohol, slightly soluble in acetone and ether and very soluble in water. The aqueous solution is neutral to litmus. It is precipitated from its solution by alkalies and the ordinary alkaloidal reagents. It has been tested by physiological methods and its anesthetic power has been proved to be as great, if not greater, than that of novocaine, while its toxicity is considerably less. It is made by Parke, Davis & Co., who have so far only made it in sufficient quantities for clinical and physiological tests. It is understood, however, that the product will be placed on the market in a few weeks. (Am. Drug.)

Aquathalmica is the name given to an eye lotion containing, according to the Holland Weekblad, sulphate of zinc, tincture of opium and saffron, and distilled water. (Am. Drug.)

Aqua Ophthalmica Conradii is said to consist of zinc sulphate in a very dilute solution of camphorated tincture of opium in distilled water. (Am. Drug.)

Aqua ophthalmica Rommershausen is said to be diluted fennel water. (Drug. Circ.)

Argaldin is a compound of silver and albumin with hexamethylenamine. Contains 8.9 per cent. Ag. Employed as an antiseptic in 10 per cent. aqueous solution. (Merck's Rep.)

Arphoaline is a arsenic, phosphorus and albumen combination advanced as a remedy in the treatment of carcinoma by Gnezda of Hamburg. (Am. Drug.)

Arsenohyrgol. A combination of enesol with arsenic. Employed in syphilis. (Merck's Rep.)

Arsphenamine.—The Federal Trade Commission having adopted the name "arsphenamine" as the term to apply to 3-diamino-4-dihydroxy-1-arsenobenzene, first introduced as salvarsan, the Council on Pharmacy and Chemistry voted to adopt this abbreviated name in place of arsenphenolamine hydrochloride now in New and Non-official Remedies. (J. Am. Med. Assoc.)

Arthigon, according to the *Schweizerische Apotheker Zeitung*, is a high grade of polyvalent gonococci vaccine asserted to be a specific in the treatment of that disease. It is marketed in 6 mil syringes by E. Schering. (Am. Drug.)

Arsesin occurs in the form of sterilized injections consisting according to the analysis of B. Kather of a normal saline solution of chloretone, cocaine hydrochloride and adrenaline.—*Apoth. Ztg.*; through *Chem. Abstracts*, 11 (1917), 2258.

Autan is the name given to an intestinal astringent and antiseptic containing hydroxide of aluminum in colloidal suspension, together with a tannin derivative. Professor Cloetta, a European specialist, first suggested the combination and it has been prepared and marketed by Seigfried, of Zofingen, Germany. The preparation is said to pass undissolved through the stomach, not being acted on until in the intestinal tract. The same journal reports that it has been used with success in the medical service of the Swiss army. (Am. Drug.)

Auxolin, a product of the firm of Wolff & Son of Karlsruhe, according to an analysis published by Schmedes, a chemist of Göttingen, is simply an alcoholic weak soap solution, with added castor oil and perfume. It is much advertised on the Continent as a scalp cleanser and purifier. (Am. Drug.)

Bactanat is an antiseptic absorbent consisting of an iodine radical in combination with methylthionine hydrochloride. It is a bulky bluish powder containing less than 10 per cent. of moisture and combined water and 1.2 per cent. ash. It is only slightly soluble in cold water and more soluble in warm water. Bactanat appears on the market both in powder and in tablet form. (Am. Drug.)

Balnacide is a disinfectant and antiseptic marketed by Doctor Noerdlinger, of Florsheim, Germany, the composition of which is not definitely established. (Am. Drug.)

Biniodol.—The Council on Pharmacy and Chemistry reports that Biniodol is claimed by the manufacturer to be a solution of 1 per cent. mercuric iodide and 2.75 per cent. guaiacol in a vegetable oil and that it is marketed with the implication that it is new

and superior to other oil solutions of mercuric iodide. The Council found that the claims of novelty and of superiority were not substantiated by the evidence.—J. Am. Med. Assoc., 68 (1917), 650. (W. A. P.)

Bioplastin, "Serono," is an Italian specialty said to represent an emulsion of lecithin and lutein (25 per cent.) in normal serum. Professor Serono, of Turin, is the originator of the preparation, and it is recommended in anemic conditions of women as well as in the treatment of tuberculosis in certain stages. It is marketed in 1.5 mil vials. (Am. Drug.)

Bisgallo is a palatable suspension of bismuth subgallate (1.0 Gm.) and salol (0.15 Gm.) in 30 mls of vehicle flavored with cinnamon. The medicaments are said to be perfectly suspended, and are probably brought into this state of suspension through the use of casein or some such agent. Parke, Davis & Co., of Detroit, are responsible for this new addition to the list of specialties. The dose is from a teaspoonful to a tablespoonful (4 to 15 mls). (Am. Drug.)

Bismolam Salve contains bismuth oxychloride, zinc oxide supracrenal solution, eucaine hydrochloride and menthol combined with a base consisting of wool-fat and petrolatum. (Chem. Abstracts.)

Boroverline is unobtainable at the present time in Holland, and H. Van't Sant recommends to use a product which is prepared from hexamethylenetetramine and boric acid according to the equation $(\text{CH}_2)_6\text{N}_4 + 3\text{H}_3\text{BO}_3 = (\text{CH}_2)_6\text{N}_4.3\text{HBO}_2 + 3\text{H}_2\text{O}$. 140 parts of finely powdered hexamethylenetetramine is mixed with 186 parts of boric acid and a few drops of water and the mixture is allowed to stand for several days with frequent stirring. Both the added water and that formed by the reaction is carefully removed by gentle heating. Thus 272 parts of Boroverline are obtained. Prescriptions containing hexamethylenetetramine and boric acid should always be dried before being dispensed.—Pharm. Weekblad, 54 (1917), page 259. (H. E.)

Brassolat, a liquid specialty, introduced by Doctor Faller, of Berlin, contains a combination of guaiacol and brassicamine, an alkaloid (?) from *Brassica napus* (Rape). According to the Hol-

land Weekblad, it is simply a mixture of the fluidextracts of *Thymus vulgaris*, *Eucalyptus globulus*, *Brassica napus*, and guaiacol flavored with orange. It is used in the treatment of pulmonary affections. (Am. Drug.)

Bromogen is a yellowish fluid containing a little over 3 per cent. of organically combined bromine and is employed wherever bromides are indicated, and is especially recommended in the treatment of epilepsy. (Am. Drug.)

Bromotan is bromotannin-methylene urea. (Am. Drug.)

Bynogen consists of casein and glycerophosphates. (Drug. Circ.)

Calorigen is the name given to an analgesic plaster dressing recommended for the treatment of muscular rheumatism and containing a pepper extract with menthol and methyl salicylate. It is manufactured by the International Surgical Dressings Manufacturing Company, a Swiss concern. (Am. Drug.)

Candioline is described as the "calcium salt of a carbohydrate-phosphoric acid ester." It is obtained from glucose and phosphoric acid by the action of a ferment. (Drug. Circ.)

Carboazid is animal charcoal, saturated with hydrochloric acid. (Chem. Abstracts.)

Carboblusan is a mixture of coal tar, Armenian bole and aluminum hydroxide used as an antiseptic and astringent application. (Am. Drug.)

Carbocaline is a granulated mixture of blood charcoal and calcium phosphate, exploited for the treatment of intestinal diseases, such as cholera, diarrhea, dysentery, etc. (Drug. Circ.)

Carbohydrol is a mixture of blood charcoal, magnesium peroxide and sodium sulphate, exploited for the same uses as carbocaline. (Drug. Circ.)

Casta-Flora is said to contain chestnut leaves, passion flower, gelsemium, elecampane, "iodized lime," menthol and yerba santa. —J. Am. Med. Assoc., 68 (1917), 303.

Chalicine Tablets contain calcium lactate and calcium glycerophosphate. (Drug. Circ.)

Chepharine is an antineuralgic and antipyretic containing a vegetable alkaloid in combination with one of the coal-tar antipyretics. Its exact composition is not known. Uhlman, of Geneva, is the originator of this new remedy. (Am. Drug.)

Chloramines.—*Their Chemistry and Application.*—J. Bougault reviews the work of Dakin on the use of organic chlorinated products in wound treatment. Bougault expresses regret at the choice of the word "chloramines" for these chemicals, since they are in truth amides. He describes the manufacture of "chloramine-T" or toluene parasulphamide dichloride and gives the properties of chlorazene, or sodium toluene para sulphonamide monochloride, which is sold in France under the name *tochlorine*. He also discusses the solvents for dichloramine-T; chlorinated eucalyptol and chlorinated paraffin oil.—J. pharm chim., 16 (1917), 274.

Chloramine-T. Paste.—M. Daufresne states that Dakin's toluene sodium *p*-sulphochloramide mixed with sodium stearate forms an active and stable paste for the treatment of wounds. The formula in use is:

Neutral sodium stearate.....	86 grammes
Chloramine-T	4 to 10 grammes
Distilled water.....	1.000 mils

The preparation is conveniently made as follows: To a liter of boiling distilled water add 80 grammes of stearic acid, and when the latter has melted gradually add enough caustic soda to saponify the fatty acid. When this operation is complete, 4 to 10 grammes of chloramine-T is added, according to the strength of the paste desired. The product is thoroughly mixed and shaken until cold. The chloramine-T paste thus produced is a smooth snow-white cream. The keeping properties of this paste are limited by the stability of the solution of chloramine-T, and one of its disadvantages is its gradual loss of strength, which amounts to

about 10 per cent. per month.—J. Exp. Med.; through Pharm. J., 99 (1917), 92.

Chlorazene.—*Uses of.*—B. L. Eicher in a paper read before the Chicago Branch of the American Pharmaceutical Association describes briefly the history of Dr. Dakin's work on antiseptics and how para-toluene-sodium sulphochloramide or chlorazene was discovered. Its action is due to the ready liberation of its chlorine atom in combination with N as NCl and its antiseptic properties are due to the NCl having the power to combine with proteins in bacteria. It has no corrosive action, is non-toxic and has a phenol coefficient of 54. One to two per cent. solutions are used.—J. Am. Pharm. Assoc., 6 (1917), 387. (H. H. S.)

Chloriagol is calcium chloriodide and is used internally in the treatment of asthmatic conditions. The dose is from five to fifteen grains (0.3 to 1.0 Gm.). (Am. Drug.)

Chlorosan is a chlorophyl preparation put forward for the treatment of chlorosis, and, on account of its favorable action on the heart muscles, for the treatment of arteriosclerosis. (Drug. Circ.)

Cholis is the name given to a cholagogue pill containing sodium oleate and gallic acid, and intended as a remedy in the treatment of gallstone disease. (Am. Drug.)

Cinofer is a liquid remedy containing quinine with an organic form of iron said to be a valuable hematinic and general tonic. It is a Swiss product. (Am. Drug.)

Citresia, the hydrated acid magnesium citrate, has been admitted into New and Non-Official Remedies. It is a colorless salt, very soluble in water and having a pleasant acid taste. It may be administered in place of solution of magnesium citrate by dissolving 25 grammes in 25 mls syrup of citric acid and 125 mls of water.—J. Am. Med. Assoc., 69 (1917), 199. (W. A. P.)

Citrovanilline is the name given to a physical mixture of pyramidon, vanillin, citric acid and sugar marketed in single dose packages of 1 Gm. (Am. Drug.)

Coeliacin is an extract of the desiccated mesenteric glands, having the appearance and general characteristics of this type of therapeutic agents. Not much chemical evidence is at hand concerning this new remedy. (Am. Drug.)

Coluitrin is the name given to a pituitary extract purified and treated by a special process. It is prepared after a manner recommended by Freund and Redlich, of Berlin. (Am. Drug.)

Coronad is a nutrient and stimulating food consisting of banana meal, cacao, albumen and blood salts. It is marketed by Apothecary Keller, of Mulhausen. (Am. Drug.)

Cymarin, the active principle in the root of dogbane (*Apocynum cannabinum*) is recommended by Wiesel as an excellent succedaneum for digitalis and its derivatives. (Am. Drug.)

Cymasin is a purified yeast said to be entirely free from fermentable carbohydrates and for that reason particularly adapted for use in the accurate quantitative estimation of sugar by the fermentation process. (Am. Drug.)

Danozon Liquor is, according to Mannich, a solution of sodium chloride and vanadic acid. (Drug. Circ.)

Diaseptol is a new absorbent dusting powder consisting of dried lead plaster, zinc stearate and dried lanolin with other medicinal agents. It is said to be perfectly neutral and non-irritating, and at the same time antiseptic and healing. It is a Swiss proprietary Doetsch & Co., of Basel, being the originators. (Am. Drug.)

Dichloramine-T has been used by Surgeon J. E. Sweet in the treatment of war wounds. He reports that dichloramine-T, dissolved in chlorinated eucalyptol and chlorinated paraffin oil is of great value in the treatment of infected wounds because it saves the pain of wound dressing, reduces the time of dressing and the cost of materials used.—J. Am. Med. Assoc., 69 (1917),* 1076. (W. A. P.)

Digaloid is a solution of pure digitoxin each mil of which is equivalent to 150 Mg. (2.3 grains) of fresh digitalis leaf. (Am. Drug.)

Dissolvlin is the fanciful name given to a liquid soap which contains a small percentage of iodine in solution. It is highly recommended by its makers as an antiseptic and germicidal soap. (Am. Drug.)

Dryoxide, according to the chemists of the American Medical Association laboratory, is essentially sodium perborate. (Chem. Abstracts.)

Elarson is an arsenical compound prepared by Emil Fisher, which has been introduced in therapeutics by von Klemperer as a comparatively non-toxic substance. It is strontium chlorarsinosobenolate, and is a slightly colored powder, insoluble in water. Each tablet contains one-half milligramme of arsenic. (Pract. Drug.)

Enema Cantani contains tannic acid, soap and hydrochloric acid. (Drug. Circ.)

Energine is preparation of cod liver oil with chocolate. (Drug. Circ.)

Ergotin Loster is prepared from ergot which has been previously subjected to vapor of ethyl alcohol. It comes in the form of a solution marketed in ampuls as well as in combination with cotarine hydrochloride (stypticin) in the form of easily soluble tablets. (Am. Drug.)

Erodium cicutarium, a plant common in Holland, is an excellent substitute for hydrastis as a styptic in uterine hemorrhages. It is non-toxic. The hemostatic property is not due to tannin. (Chem. Abstracts.)

Erystypticum, as indicated by its name, is a new styptic and hæmostatic recently introduced by Hoffman-LaRoche & Co., Basel, and is supposed to represent ergot and hydrastis constituents in combination. It is used chiefly in gynecological practice, twenty to thirty drops being administered in water two to three times a day. (Am. Drug.)

Essentia Anodyna Viridis is a combination of green or fresh drug tinctures containing probably cannabis and belladonna with other

anodyne drugs. It is recommended as an application in lumbago, neuralgia, etc., by its manufacturers, the Society of Chemical Industry, St. Margrethen, Switzerland. (Am. Drug.)

Eusol.—This solution of calcium hypochlorite and boric acid (See Year Book, 1916, 119) is recommended by J. A. Powell, who gives particulars of an almost hopeless case of acute sepsis of the blood-stream in which improvement followed at once an intravenous injection of 40 mils of eusol preceded by 300 mils of normal saline.—Brit. Med. J., through Chem. and Drug., 89 (1917), 8.

Extractum Chinae Nanning is the name given to a nonalcoholic extract containing the total alkaloids of cinchona in a less bitter and more agreeable combination than is usually found in cinchona preparations, and contains 5 per cent. total alkaloid. M. Wirz, a Basel apothecary, compounds this new specialty. (Am. Drug.)

Factolac is a "combination of vegetable substances" said to be very useful in making stable emulsions of both volatile and fixed oils. It is manufactured by Hopkins & Co., New York City. (Am. Drug.)

Fenoval consists of bromovaleryphenetidine. It occurs in tasteless odorless needles, melting at 149–150° and is insoluble in water. It is recommended as a hypnotic and antineuralgic and is claimed to be only slightly toxic. (Chem. Abstracts.)

Ferrine is said to consist of ferric caseinate solution, glycerin, alcohol, and syrup. (Drug. Circ.)

Ferrogen "Astra" is an iron-casein-pepton preparation. (Drug. Circ.)

Fischol is a cod-liver oil preparation appearing on the market in powder form. It is a white to light brown powder lacking the characteristic heavy fish odor, and consists of nuclein, albumin, organic iodine, calcium glycerophosphate and other salts. It is recommended by its originator, Otto Vester, an apothecary of Hanau, as a palatable succedaneum for the unpalatable and nauseating cod-liver oil and is especially recommended as a children's

tonic. According to the *Apotheker Zeitung* an approximate analysis of the product partially sustains the claims of the maker. (Am. Drug.)

Fisher Remedy, according to the chemists of the American Medical Association Laboratory, consists essentially of mercury with chalk and mercuric subsulphate. (Chem. Abstracts.)

Formalactol is an antiseptic and astringent gargle containing a non-irritating formalin compound. It is manufactured by the Society of Chemical Industry, St. Margrethen, Switzerland. (Am. Drug.)

Gelarin is a new antiseptic ointment base containing petrolatum, lanolin, a fixed oil and an inert filling powder. It is marketed in various combinations, with methyl salicylate, tar, etc. Von Hausmann, St. Gallen, Switzerland, is the manufacturer. (Am. Drug.)

Gélotanin.—E. Choay recommends as a substitute for tannalbin or tannigen, a preparation made by pouring a solution of 12 parts of tannin in sufficient water into a sterilized solution of gelatin in almost 2000 parts of water. The precipitated tannate of gelatin after washing by decantation and drying, occurs in the form of a white, odorless, nearly tasteless powder, very sparingly soluble in water, insoluble in dilute acids, but soluble in alkali. It is used as an antidiarrheic.—*J. pharm. chim.*, 16 (1917), 137.

Glutiodin is an iodine proteinate appearing on the market as a dark yellow powder forming with water a peculiar colloidal suspension. It is used either internally or externally and is given internally in doses as of other similar organic iodine compounds. (Am. Drug.)

Glykol is the misleading name given to a glycerin substitute of unknown composition. It is a thick, colorless, faintly yellow liquid, very hygroscopic, of neutral reaction, boiling at 198° C. and freezing at -13° C. It has a specific gravity of 1.12, reduces Fehling's solution, indicating the presence of some reducing sugar, probably glucose, and is miscible in all proportions with alcohol and water. Ichthyol, gelatin, tannin, etc., are entirely dissolved by it, and it is said that it can be used to replace glycerin to a remarkable

extent. It is of German origin. (See Tego-glycol.) Glycol, or ethylene glycol, is a sweet syrupy liquid, specific gravity 1.15, boiling at 195° C. and miscible in all proportions with alcohol and water. It has the formula $C_2H_6O_2$ and may constitute part or all of this new glycerin substitute. (Am. Drug.)

Gox.—An electrolytic silver compound containing 16.09 per cent Ag.—Reddish brown solid easily soluble in water.—Used as an antigonorrheic in 0.25–2 per cent. solutions. (Merck's Rep.)

Guaiacol Chloriodide.—See Chlorigol.

Guaiodine is described as an electrolytic suspension of iodine in a bland and non-rancid oil together with guaiacol. It is employed as an antiseptic and healing application to open sores, abraded surfaces, etc., and as an injection in gonorrhea. (Am. Drug.)

Guakasan, recommended as a reconstructive tonic in the treatment of tuberculosis and chronic bronchitis, is an emulsion of guaiacol in a casein solution. (Am. Drug.)

Haemostaticum Fischl is a powdered extract of lungs, put forward as styptic for external and internal hemorrhages. (Drug. Circ.)

Halozone Tablets or parasulphondichloraminobenzoic acid, according to Dakin and Dunham, affords an easily prepared, cheap, stable, and effective means for sterilizing water. This is made into tablets weighing from 100 to 105 milligrammes by compressing the following mixture: Halazone, 4; sodium carbonate, 4 (or dried borax, 8); pure sodium chloride, 92. The halazone should be rubbed down with the dried sodium chloride, and the sodium carbonate or borax added last. The powder is then passed through a 40-hole sieve. No lubricant is necessary for compressing. The strength of the tablets should be checked by dissolving in acetic acid (not in water), adding potassium iodide, and titrating with a decinormal thiosulphate solution; 1 mil of this = 0.00675 gramme of halazone. Tablets prepared with the above mixture should contain 4 milligrammes of halazone, which is sufficient to sterilize a quart of reasonably contaminated water. When only grossly polluted water is available, a second tablet should be used. The tablets should be stored in amber glass bottles. When thus stored,

no decomposition has been noted in two months. If packed in white glass bottles and exposed to sunlight, decomposition is more marked. It is estimated that 100 gallons of water can be sterilized in this manner at the cost of a penny.—*Brit. Med. J.*; through *Pharm J.*, 98 (1917), 499.

Harrington's Solution is said to consist of corrosive sublimate, hydrochloric acid, alcohol and water. (*Drug. Circ.*)

Hesperonal, a Merck contribution to the new materia medica, is a combination of the phosphates and carbonates of calcium, sodium, and iron. It is recommended as a nutrient and tonic. (*Am. Drug.*)

Hexa-co-sal-in, according to the chemists of the American Medical Association laboratory, is a mixture of hexamethylene-amine, magnesium salicylate and a colchicum preparation. (*Chem. Abstracts.*)

Hexamethylene-Silver Glycocholate is a colorless or slightly colored powder, easily soluble in water and in hot alcohol. It is used as an antiseptic. (*Am. Drug.*)

Hydrantoin.—*Use as Hypnotics.*—A. Piotrovski reports on excellent results obtained with hydrantoin in producing sleep. The dose of both phenylethyl hydrantoin and its sodium salts for strong persons is about one-half gramme. The acid is tasteless while the sodium salt is bitter; the latter therefore is preferably administered hypodermically or intramuscularly, by which at the same time a more intense action is produced. Only in rare cases bad after-effects consisting in slight necrosis, were noticed.—*Münch. Med. Wochschr.*; through *Pharm. Weekblad*, 54 (1917), 164. (*H. S.*)

Hypamin is the solution of an extract of the infundibular portion of the hypophysis. It is marketed in amber colored ampuls. Clinical evidence is lacking. (*Am. Drug.*)

Ichthytar is an ichthyol substitute, which failed to meet the approval of the Council on Pharmacy and Chemistry.—*J. Am. Med. Assoc.*, 68 (1917), 796.

Insektenpoeder (Insect Powder).—According to the Holland Weekblad, a proprietary vermin powder sold largely in that country, consists of infusorial earth 470, naphthalin 70, oil of clove 50, oil of eucalyptus 30, oil of cade 30, xylol 30, and Venice turpentine 20, parts by weight. (Am. Drug.)

Insektoform comes as a dusting powder, a salve and a solution and is a combination of paraformaldehyde with various highly aromatic bodies. It is used as an application for body vermin, etc. (Am. Drug.)

Inulacea is a liquid extract of inula (elecampane) and echinacea said to be of value in the treatment of tuberculosis. It is marketed by the William S. Merrell Chemical Company of Cincinnati. (Am. Drug.)

Iod-izd Oil, according to the chemists of the American Medical Association laboratory, is essentially a solution of iodine in liquid petrolatum. (Chem. Abstracts.)

Iodex Liquidum is a stable solution of iodine presented in a non-irritating and non-staining form. It may be used by spray or swab where ordinary preparations of iodine are inadmissible. It contains $2\frac{1}{2}$ per cent. of iodine. (Am. Drug.)

Ioditin is the name given to an Italian specialty, an urethral suppository containing an organic iodine compound and ichthyol. (Am. Drug.)

Iodo is a solution of albuminate of iodine, or iodine in a weak organic combination, marketed in sterile ampuls ready for hypodermic injection. It is also an Italian specialty. (Am. Drug.)

Iodoform-Acetone, according to the formula of Doctor Heinen, published in the "Münchener Medicinische Wochenschrift," consists of

Iodoform.....	10 Gm.
Acetone, purified.....	100 Gm.
Ammonia.....	3 drops

The mixture is allowed to stand three days and then filtered. It is said to be styptic as well as antiseptic. (Am. Drug.)

Iodogen.—A solution each fluidrachm of which contains 1 grain organically combined iodine, and employed in gout, aneurism, arteriosclerosis, rheumatism, arthritis, asthma, etc. (Merck's Rep.)

Iodosan is a 3 per cent. aqueous solution containing dissolved iodine, in a nascent atomic condition. It may be used in its pure state without injury to the cornea and conjunctiva. It is more readily absorbed than an ordinary iodine solution of the same iodine content; when dropped into the conjunctival sac it produces a characteristic iodine reaction in the aqueous humor. (Chem. Abstracts.)

Iodine-Miller, according to the chemists of the American Medical Association laboratory is a glycerinic solution containing 1.68 per cent. of iodine and 1.80 per cent. of potassium iodide. (Chem. Abstracts.)

Joddiuretal is a combination of 0.2 Gm. potassium iodide and 0.5 Gm. theobromine in tablet form. (Chem. Abstracts.)

Jubarol is a water-soluble thick liquid containing a coal-tar disinfectant, probably tricesol, and is recommended as a general local antiseptic. It is prepared by the Society of Chemical Industry, St. Margrethen, Switzerland. (Am. Drug.)

Karbolin is a solution of phenol in acetone and glycerin said to be extensively used by German surgeons during the present war as a strongly antiseptic and analgesic dressing. (Am. Drug.)

Kephalin is used to hasten coagulation and hemostasis after surgical operations. According to H. L. Cecil, it causes a quicker and firmer clot. Not as much pressure in packing is required to control hemorrhage as when plain or iodoform gauze is used. When the packs are removed, the clot is of sufficient firmness to prevent bleeding. This is not true of other packs.—J. Am. Med. Assoc., 68 (1917), 628. (W. A. P.)

Laktosan is a white, farina-like powder possessing an agreeable taste. It is claimed to contain various ferments in stable form and is recommended in the treatment of glycosuria, and various

disorders of the stomach, intestines and bladder. (C. U. C. P. Al. J.)

Laneps is a synthetic ointment base, similar to lanolin, prepared by Fr. Bayer & Co., and marketed by the same firm. It is an unctuous, practically odorless mass similar in appearance to wool fat and capable of holding up to 50 per cent. of water. It is a bland and nonirritating base. (Am. Drug.)

Lanoligen is a naphtha derivative advanced as a lanolin succedaneum. It is capable of holding 75 per cent. of water. According to the Holland Weekblad, it is a yellowish hygroscopic substance and compares favorably with lanolin except in its absorbability. (Am. Drug.)

Laxamel is an 80 per cent. emulsion of heavy paraffin oil sweetened agreeably with honey. (Am. Drug.)

Laxipomin is a stiff apple jelly containing a laxative and is sold as small cubes easily chewed and said to be extremely palatable. (Am. Drug.)

Lekosan Tablets contains kola, lecithin and casein. (Drug. Circ.)

Lentillax is the name given to a French specialty in pill form, each pill containing aloin 5 Mg., and podophyllin 15 Mg., extract of nux vomica 2.5 Mg., and hyoscyamine 0.25 Mg. It is, of course, a laxative pill. (Am. Drug.)

Lepso, according to the chemists of the American Medical Association laboratory, is an epilepsy remedy containing 22.5 Gm. bromides to 100 mls. (Chem. Abstracts.)

Levurinosé is a yeast paste employed in the treatment of boils and inflamed wounds. (Drug. Circ.)

Linimentine is prepared by macerating for one week 2 parts of capsicum and 1 part of camphor in 1 part of 90 per cent. alcohol and 5 parts of ammonia water. The mixture is then filtered and

to the filtrate, 2 parts of tincture of quillaja are added. (J. pharm. chim.)

Lipiodine-Ciba is the ethyl ester of iodobrassicidic acid containing 41 per cent. of iodine. It is odorless, tasteless, insoluble in water but very soluble in fatty oils. When administered, it is absorbed almost completely and excreted more slowly than inorganic iodides but more rapidly than with other iodized fats. It is said to be less likely to produce gastris irritation than ordinary iodides.—J. Am. Med. Assoc., 68 (1917), 1985. (W. A. P.)

Liquidrast is the trade name for liquor hydrastini Bayer. (Drug. Circ.)

Liquor Blaserii is an antiarthritic remedy composed of colchicine 1, cinchonine 1.1, quinine muriate 2.5, citric acid 5 and sherry wine to make 500, parts by weight. (Am. Drug.)

Liquor Chlumsky, prepared after the formula of Dr. Rijchlick, is a concentrated antiseptic solution consisting of phenol 30, camphor 60 and absolute alcohol 10, parts by weight. (Am. Drug.)

Liquor ferri valerianatus Weinbuch is said to contain saccharated iron oxide, syrup, fluidextract of valerian, citric acid, vanillin, peppermint oil, amyl acetate, alcohol and water. (Drug. Circ.)

Litkine is the trade name given to a pill manufactured after the formula of Dr. C. P. Dexant, of Paris. The main constituents of this medicament are iron, arsenic and phosphorus, and it is recommended in the treatment of chlorosis, anemia and kindred ailments. (Am. Drug.)

Locosthetic is placed on the market by Parke, Davis & Co., of Detroit, as a new local anesthetic to fill the place of the unobtainable novocaine and stovaine for the surgeon and dentist. It is supplied in one-ounce vials and consists of

Cocaine hydrochloride.....	0.75 per cent
Adrenaline chloride.....	1:50,000
Thymol.....	1:1,500
Physiologic salt solution, to make 1 fluidounce	

The solution is saturated with chloretone to insure stability. It

is said to produce anesthesia, "apparently equal to that of a 2 per cent solution of cocaine alone." (Am. Drug.)

Luteum Opton is an extract of corpus luteum representing the blood coagulating principle of that body. (Am. Drug.)

Maltavene is the name given to a concentrated malt extract reinforced by the addition of certain nutritious sugars. It is a French product. (Am. Drug.)

Medorrhine is a new homeopathic specialty recently introduced on the continent and contains medicinal ingredients in so small a proportion as to defy analysis. It is used in the treatment of gonorrhea. (Am. Drug.)

Menarsen is the name given to a tablet remedy each tablet containing 0.005 gramme of manganese glycerinophosphate, 0.00016 gramme of arsenous acid, 0.02 gramme of extract of gentian and 0.05 gramme of powdered licorice root. It is marketed as a tonic of value in the treatment of anemia, chlorosis, etc. (Am. Drug.)

Mentholan, made by Apothecary Polasek, of Meran, Holland, is an external application, recommended in the treatment of rheumatism. It consists chiefly of menthol and methyl salicylate in a volatile solvent. (Am. Drug.)

Mercurophen, according to Shamberg, Kolmer and Raizin, occurs in the form of an odorless, brick-red powder, readily soluble in water. Chemically it is sodium oxymercuri-*o*-nitrophenoxide, and contains about 53 per cent. of mercury. Experiments are said to have shown it to be 50 times more active than mercuric chloride against *Staphylococcus aureus*, causing a complete destruction of the bacteria, after prolonged exposure in bouillon and in a dilution of 1 : 10,000,000. In a medium consisting of ascitic fluid its germicidal activity was found to be 200 times greater than that of mercuric chloride against *S. aureus*. Against *Bacillus typhosus* it exhibits 10,000 times greater activity than phenol when compared by the Rideal-Walker method, and more than 30 times greater activity than does mercuric chloride when compared by the same method. Surgical disinfection of the hands by means of mercuric

chloride requires immersion in solutions 1 : 5000 for 5 minutes, and in solutions 1 : 10,000 for 15 minutes. Solutions of mercuraphen on the other hand, even in dilutions of from 1 : 10,000 to 1 : 40,000, accomplish such disinfection in one minute. Ordinary rubber tubing is sterilized completely by immersion in 1 : 100,000 solutions for 30 minutes. To accomplish the same result with mercuric chloride, a solution of 1 : 16,000 must be employed. Its toxicity also is said to be much less than that of mercuric chloride. Another advantage it possesses is that its protein precipitating effect is much less than that of mercuric chloride.—J. Am. Med. Assoc., 68 (1917), 1458. (G. C. D.)

Metargen is a silver protein compound occurring as a fine, brown powder easily soluble in water and used like other similar silver compounds, particularly in ophthalmology as a 2 to 5 per cent. solution. (Am. Drug.)

Musterole.—D. I. Macht reports the base of a scarlatiniform eruption, evidently caused by an application of Musterole, a proprietary composed essentially of lard or some similar material, oil of mustard, menthol and camphor. Macht reports on the effects of mustard oil and warns against its careless use.—J. Am. Med. Assoc., 69 (1917), 901. (W. A. P.)

Muthol is the name given to a flavored jelly consisting chiefly of liquid paraffin. It is marketed by R. Demuth, a pharmacist and manufacturer in London. (Am. Drug.)

Myrosom is a mixture of salol, nutmeg butter, monobromated camphor, oil of sandalwood and oil of cubeb, dispensed in gelatin capsules. (Chem. Abstracts.)

Neo-quinine is quinine glycerinophosphate $(C_3H_7O_3PO_3).(C_{20}H_{24}N_2O_2)_2$ in a high state of purification. It is a crystalline powder soluble in hot water and alcohol. It represents 68 per cent. quinine and is given in the same doses as the sulphate. It is used as a tonic in the nervous debility following malaria. The Clin laboratories of Paris are the marketers of this product. Quinine glycerinophosphate is by no means a new remedy but the Clin designation for this product is apparently quite recent. (Am. Drug.)

Neutropetrol is an especially high grade of liquid paraffin, having a high density and remaining clear at freezing temperatures. It is a French product. (Am. Drug.)

"Nikalgin."—A recent issue of Collier's contains an article on "Nikalgin." Far-reaching claims for its anesthetic and antiseptic virtues have been made. While no very definite information seems to be forthcoming regarding the preparation, it has been said to be "composed of quinine, hydrochloric acid and urea." This would indicate that "Nikalgin" may be nothing more wonderful than the well-known local anesthetic, quinine and urea hydrochloride, or a modification of it.—J. Am. Med. Assoc., 69 (1917), 1024. (W. A. P.)

Nirvanin is phenyl-ethylhydrantoin, which occurs as a crystalline colorless and odorless powder. Its sodium salt is marketed in solution in ampuls for intramuscular injection. (Drug. Circ.)

Noridin is a non-irritating and stable oil solution of iodine, of which it contains 5 per cent. It is a dark brown fluid easily absorbed by the tissues and leaving no stain. It is a recent introduction to the specialty list of the Norwich Pharmacal Company. (Am. Drug.)

Noriform is a compound of tetrabromopyrocatechol and bismuth having the formula $\text{Bi}(\text{C}_6\text{Br}_4\text{O}_2)\text{OH}$. It is a yellow, inodorous, tasteless powder, yielding 32 per cent. of bismuth oxide. It is insoluble in water, slightly soluble in alcohol and in ether, is non-irritant, only slightly toxic and is used as a wound dressing and as an application in venereal affections, burns, ulcers and fistulas. (Chem. Abstracts.)

Novotryposafrol, an aniline dye, is recommended in the treatment of trypanosomiasis. It is soluble in a hydroalcoholic menstruum. (Am. Drug.)

Nuklofer "Astra" is iron nucleinate. (Drug. Circ.)

Oil of Bismuth.—This fantastic title is given to a suspension of finely powdered bismuth subnitrate in a solution of ten parts of white petrolatum in 70 parts of liquid paraffin. The bismuth salt

constitutes one-fifth the weight of the product. It is used in filling cavities, being really a modified Beck's paste. (Am. Drug.)

Oil of Salt, according to the chemists of the American Medical Association laboratory, is a mixture of linseed oil, hydrochloric acid (free and combined about 0.52 per cent.) turpentine, camphor and oil of sassafras. (Chem. Abstracts.)

Optannin is given the formula $\text{Ca}(\text{OH})\text{C}_{14}\text{H}_9\text{O}_9$ and is an amorphous light brown, insoluble powder, slightly soluble in weak acid solutions. It is used as an intestinal astringent and is marketed by Knoll & Co., Ludwigshafen. (Am. Drug.)

Optonen is the name given to a group of soluble glandular extracts prepared by Merck. The work of preparing correct data concerning this group of remedies and clinical experiments with the product are under way and will be reported on later. (Am. Drug.)

Ossine is a nutritive remedy consisting of gaduol (a cod-liver oil derivative) and albumin. It contains 75 per cent. fat, 24 per cent. carbohydrates, and 1 per cent. albumin and mineral matter. (Am. Drug.)

Paeonine is the name given to the alkaloid of *Paeonia officinalis*, occurring as an amorphous, yellow powder possessing an intensely bitter taste. It is recommended as a styptic and hemostatic and is given especially to arrest hemorrhages of any source. It is also said to be effective in nosebleed or in hemorrhages following tooth extraction. (Am. Drug.)

Pancrotan is a highly purified and concentrated pancreatic extract marketed by Van Hausmann, St. Gallen, Switzerland. (Am. Drug.)

Pankrotanon is a new pancreatin preparation obtained from the salivary glands of cattle. (Drug. Circ.)

Paraffinol is an emulsion containing 75 per cent. of liquid petrolatum. It is marketed by J. Blomberg of Gravenhage, Germany. (Am. Drug.)

Paraquin is a salve, marketed by Dr. Henning, of Berlin, and is a petrolatum and an organic peroxide mixture. It is practically a permanent product, giving up its oxygen only on contact with the tissues. (Am. Drug.)

Parlodion.—A shredded form of concentrated collodion for imbedding tissues for section cutting. (Merck's Rep.)

Parresine.—A mixture composed of paraffin, 94 to 96 per cent.; gum elemi, 0.20 to 0.25 per cent.; Japan wax, 0.40 to 0.50 per cent.; asphalt, 0.20 to 0.25 per cent., and eucalyptol, 2 per cent. Parresine acts mechanically. It is used in the treatment of burns, "frostbite," "chilblains" and for covering denuded surfaces. For use parresine is melted and applied while liquid by means of an atomizer or brush.—J. Am. Med. Assoc., 68 (1917), 1406. (W. A. P.)

Pelliform, a soap containing a large portion of carbon tetrachloride, and marketed in liquid form, is intended for use in skin diseases due to staphylococci, and also to animal parasites, scabies, etc. (Am. Drug.)

Perglycerin is an organic body of the aliphatic series, used as a substitute for glycerin. (Am. Drug.)

Petrochondrin is, as the name indicates, a chondrus (Irish moss) emulsion of medicinal petroleum oil. It is said to be free from any oily taste and is held to be superior to the plain oil in that it mixes thoroughly with the feces. (Am. Drug.)

Phosphal is a lecithin preparation containing in addition iodide of potassium and glycerophosphates of iron and magnesium, and agreeably flavored with chocolate. It is sold in tablet form and is recommended as an active alterative. (Am. Drug.)

Pierce's Anuric Tablets, according to the chemists of the American Medical Association laboratory, contain sugar, acetate, iodide and salicylate of either sodium or potassium, quinine, aloin, hexamethylenamine and plant drugs. The composition of the tablets is so evidently irrational and absurd that an exhaustive analysis

was not deemed worth while.—J. Am. Med. Assoc., 69 (1917), 930. (W. A. P.)

Pituglandol contains, besides the proteinogen amines common to other organic extracts, a specific active principle, which exerts a characteristic action on the blood pressure and respiration, and which increases the tonus of the rat uterus, reports Guggenheim. It is very sensitive to alkali. Fine powders, such as talc or lead sulphide, absorb the active principle in large quantity. It resembles acetylcholine, and also some degree pilocarpine, in its chemical and pharmacological characters. It differs, however, from acetylcholine in producing a secondary increase of blood pressure after repeated injection. It is possibly composed of an alkanolamine with an acyl residue. It differs from β -imidazoethylamine which is stable towards alkali, as well as by its action on the rat uterus. (Pract. Drug.)

Pneumogen, another Von Hausmann product, is a salve, gelinein (which see) base, containing camphor and guaiacol. It is applied to the chest with friction in treatment of lung diseases. (Am. Drug.)

Propyl Hydrocupreine Dipropylbarbituric Acid is the tedious name given to a combination of these quinine derivatives with dialkyl-barbituric acid. They are considerably stronger narcotics than the corresponding quinine derivatives and much less toxic. Merck has recently patented such a product. (Am. Drug.)

Puriodal is a combination of iodine and smilacin (a sarsaparilla derivative) intended as a useful alternative remedy. It is marketed by Doctor Hellmans, an apothecary of Weenen, Germany. (Am. Drug.)

Purostrophan is the name given by Thoms for crystalline strophanthin obtained from *Strophanthus gratus*. (Chem. Abstracts.)

Pyrosana is a bismuth paste the accurate composition of which is not known, and is marketed by the Internationale Verbandstoff Fabrik, Berne. (Am. Drug.)

Quinocol consists of tablets containing two grains of quinine sulphoguaiacolate and two grains of extract of *piscidia erythrina*. They are used in tuberculosis.—J. pharm. chim., 15 (1917), 388.

Quinoform.—Basic quinine formate, $C_{20}H_{24}N_2O_2 \cdot COOH$.—Intended for subcutaneous use in chills and malaria. (Merck's Rep.)

Reactol, exploited as a remedy for obesity, is said to consist of sodium chloride, calcium carbonate, magnesium carbonate and traces of lithium carbonate and sodium sulphate. (Drug. Circ.)

Redintol.—This is a paraffin mixture for the treatment of burns. It is marketed with the following statement of composition "Paraffins 95 per cent. combined with Resina Palaquium and Oleum Picis Liquide." This means little and probably was so intended. Oleum picis liquide is oil of tar and resina palaquium is gutta percha. Simple paraffin would no doubt answer as well as this secret mixture.—J. Am. Med. Assoc., 69 (1917), 306. (W. A. P.)

Risicol, a tasteless powder consisting chiefly of castor oil, is a highly absorbent powder. It is an English specialty manufactured by R. Demuth, of London. (Am. Drug.)

Rocialysat is a partly deodorized dialyzed valerian extract, recommended as a nervine and antispasmodic. (Am. Drug.)

Rohsolutrol contains 60 per cent. of cresol in the form of its sodium compound. It is recommended as a disinfectant for stables, excreta, etc. (Chem. Abstracts.)

Sagrotan is asserted to be a molecular mixture of chlorocresol and chloroxylenol and is said to be twice as powerful a bactericide as its constituents. It comes in the form of a light brown, oily liquid of a disagreeable penetrating odor. (Am. Drug.)

Salaspin is a trade name for acetylsalicylic acid. (Merck's Rep.)

Sanageen is the name given by The Casein Company, Battersea, London, to a Sanatogen substitute. According to an analysis by Burnett, the preparations are almost identical, the English prepara-

tion containing slightly more glycerophosphates than the other and slightly more fat. (Am. Drug.)

Santonin-Bismuth is a chocolate flavored tablet containing bismuth subsantonate and phenolphthalein. It is marketed by Burroughs Wellcome & Co., as a reliable vermifuge especially intended for children. (Am. Drug.)

Sarkoptol is the title suggested for a combination of coal tar, 25 Gm., alcohol 200 Gm., compound cresol solution, 200 Gm., and petrolatum 1 kilo. (Am. Drug.)

Saurol.—According to L. Merian, this is an oily substance obtained by the distillation of a bituminous rock from near Lake Lugano, Switzerland. The purified oil contains 6 to 7 per cent. of sulphur in organic combination and it is claimed that it may replace ichthyol in all of its uses.—Vet. Rec.; through J. pharm. chim., 15 (1917), 387.

Scorogene is a French specialty intended as a regulator of intestinal functions and contains vegetable extracts fortified with phenolphthalein. (Am. Drug.)

Scotetost, a product of the European war, is sterilized pine sawdust used as an application to secreting wounds. It is used either alone or in combination with 10 per cent. of iodoform or a tenth of 1 per cent. mercuric chloride. (Am. Drug.)

Secale Loster.—See Ergotin Loster.

Septiline is an effervescent powder marketed in little packages containing the bicarbonate of the alkalies with a lithium salt and with soluble phosphates. (Am. Drug.)

Silicose is a synthetic aluminum silicate intended to replace, in the treatment of hyperacidity and hyperaesthesia, the more expensive and rarer bismuth combinations. (Am. Drug.)

Silver-Ammonium Glycocholate. — Colorless powder soluble easily in water and hot 99 per cent. alcohol, difficultly in cold alcohol, and insoluble in ether and benzene. (Merck's Rep.)

Siomine.—Hexamethylenamine tetraiodide, containing 78.5 per cent. iodine. Siomine is decomposed in the intestine with formation of hexamethylenamine and iodide. It produces the effects of ordinary iodides, from which it differs only in that, being insoluble in water, it may be administered in solid form.—J. Am. Med. Assoc., 68 (1917), 1406. (W. A. P.)

Sirocol is a syrup containing sulphoguaiacolate of potassium, sodium benzoate and flavored with bitter orange peel. (J. pharm. chim.)

Sodium Dimethylaminoazobenzene Meta-sulphonate, $C_6H_5N = NC_6H_3N(CH_3)_2CH_2SO_3Na$ is made, according to P. Lami, by treating dimethyl amidoazobenzene with formaldehyde and sodium bisulphite. It occurs in orange-yellow crystals, melting at 113° and easily penetrates the cell substance and stimulates tissue formation. It is non-irritant and has pronounced antiseptic properties. —Boll. chim. pharm.; through Chem. Abstracts, 11 (1917), 3377.

Sofos.—A mixture of sodium dihydrogen phosphate and sodium hydrogen carbonate rendered stable by coating the particles of one of the constituents with disodium hydrogen phosphate. One part of sofos has the same phosphate value as 1.75 parts sodium phosphate U. S. P. When sofos is treated with water, sodium phosphate (Na_2HPO_4) is formed and carbon dioxide is set free. Sofos has the physiologic action of sodium phosphate. It is claimed to have an advantage over the effervescent sodium phosphate preparations in that it is free from citrate or tartrate.—J. Am. Med. Assoc., 68 (1917), 1551. (W. A. P.)

Somnacetin is a new name for veronacetin, a hypnotic mixture, containing sodium diethylbarbiturate, phenacetine and codeine phosphate. (Chem. Abstracts.)

Species Laxantes Korte contains senna leaves free from resin, fennel and anise seed. (Drug. Circ.)

Spiritus Argenti Unna is a solution of 1 gramme of silver nitrate in 20 grammes of spirit of nitrous ether. (Am. Drug.)

Strychno-Phospho-Arsenat is a combination of sodium glycerophosphate, sodium monomethyl-arsenate and strychnine nitrate marketed in ampuls. (Am. Drug.)

Subcutin Mundwasser is an analgesic solution containing 2 per cent. of anesthesin paraphenol sulphonate. (Chem. Abstracts.)

Syacon Ampuls contain sodium salicylate and caffeine dissolved in water. (Drug. Circ.)

Syrgol is the name given to a colloidal silver oxide of French manufacture, soluble in water and recommended as a general antiseptic in ophthalmology, etc. (Am. Drug.)

Tachine is said to be a chemical combination of morphine and veronal. (Drug. Circ.)

Tartras Bismuthicus Solubilis is a water-soluble form of bismuth tartrate marketed by Burroughs, Wellcome & Co. (Am. Drug.)

Tego-glykol is a glycerin substitute marketed by the firm of Th. Goldschmidt, of Essen, and is probably ethylene glycol or ethylene alcohol in admixture with glucose or else by itself. (Am. Drug.)

Tethelin.—Growth-controlling principle of the anterior lobe of the pituitary body. (Merck's Rep.)

Thoranium is the trade name given to a "highly purified" nitrate of thorium, a substance which has recently come to the fore as a pyelographic agent. It is claimed to possess all the necessary qualifications, opacity, therapeutic inertia, etc., needed in an agent of this kind. (Am. Drug.)

Thorium Salts.—*Use in Dysentery*.—A. Frouin reports the successful use of thorium sulphate in 4 to 5 gramme doses in a case of dysentery, where other remedies had failed. (J. Ph. Ch.)

Thyrakrin is marketed in tablet form by a German firm and consists of iodothyreoglobulin. The iodine content is constant, being 0.15 Mg. to a tablet. It is recommended in the treatment of cretinism. (Am. Drug.)

Totopon is a mixture of the total alkaloids of opium prepared according to v. d. Wielen's process. (Drug. Circ.)

Trimethol, recommended by J. T. Ainslee Walker as an intestinal antiseptic, is a 50 per cent. gelatin emulsion of a benzene derivative (1,2,4,5,6-trimethylmethoxyphenol) with the formula $C_6H(CH_3)_3OCH_3OH$. It is administered in the form of gelatin capsules containing 2 $\frac{1}{2}$ minims, and as a syrup.—Chem. & Drug., 89 (1917), 148. (K. S. B.)

Tussisolvol is said to consist of codeine phosphate and bromoform dissolved in an infusion of ipecac. (Drug. Circ.)

Typhinen is said to be soluble albuminoids, obtained from typhoid bacilli. (Drug. Circ.)

Unguentum Dreuwii is said to consist of salicylic acid, chrysarobin, oil of cade, soft soap and wool fat. (Drug. Circ.)

Unguentum Druke is said to contain chrysarobin and salicylic acid in a vehicle of wool fat, soft soap and castor oil. (Drug. Circ.)

Unguentum neutrale contains wool fat, ceresin and liquid paraffin. (Drug. Circ.)

Unguentum Resorcini Compositum Unna, consists of 5 parts of resorcin, 5 parts of ichthyol, 2 parts of salicylic acid and 88 parts of soft ointment. (Am. Drug.)

Uricsol, according to the chemists of the American Medical Association laboratory, consists chiefly of sodium phosphate with small amounts of lithium citrate and nitrate. (Chem. Abstracts.)

Varlex Compound, according to the chemists of the American Medical Association laboratory, is a liquor and tobacco habit nostrum containing 97 per cent. of lactose and 3 per cent. of water. (Chem. Abstracts.)

Vibrona is a wine of cinchona, in which the alkaloids of the drug are present as hydrobromides. (Drug. Circ.)

Vicsol is an asthmatic remedy consisting of lobelia, belladonna, and buckthorn extracts with nitrate of potash in a glycerinated and flavored vehicle. It is marketed by a Swedish firm. (Am. Drug.)

Virogen is a nutritive preparation which is prepared from milk, cocoa and calcium phosphate. (Drug. Circ.)

Xysol is a preparation similar to lysol or liquor cresolis comp., marketed by H. C. Stevenson & Co., of London. (Am. Drug.)

Zemo, according to the chemists of the American Medical Association laboratory, is an hydroalcoholic solution containing methyl salicylate, thymol, borax, tannic acid, glycerol, menthol and a phenol-like substance. (Chem. Abstracts.)

Zonsol is similar to Xysol, and is prepared by the Standard Disinfectant Company, of London, England. (Am. Drug.)

MATERIA MEDICA

A—GENERAL SUBJECTS

DRUG PLANT CULTIVATION.

Herb Growing.—*Its Past, Present and Future in the British Empire.*—In a lecture delivered at the Royal Society of Arts, J. C. Shenstone quoted the statement by Tacitus that the climate of Britain is suitable for the cultivation of all vegetables except the vine and the olive. After discussing the present scarcity of herbs, because of the war, he talked at length on the possibilities of drug plant cultivation in Great Britain.

He pointed out the need of scientific study of the activity of dandelion; of relative value of various varieties of chamomile; and of the increase in alkaloidal yield of solanaceous drugs by selective propagation. He thinks that children should be taught to gather herbs and that farmers should be given advice as to drug plant cultivation.—Pharm. J., 98, (1917), 418.

Drug Plant Cultivation.—*In France.*—In connection with a presentation of historical data on the subject the fact is recalled that the list of simple indigenous drugs inscribed in the Codex of 1908 comprised not less than 110 species. While most of these plants grow naturally over large areas, several among them grow best and most abundantly in certain districts where the temperature and soil conditions are specially favorable to their development and the elaboration of their active principles. Thus, digitalis grown in the Vosges is very rich in digitalin, that from the Ardennes however contains very little. The article outlines the principles which should govern the cultivation and harvesting of the plants and gives besides indications of the price and the extent of sale of each, a list of the chief medicinal plants (some 80 odd) grown in France, classified according to the part which is used. Some plants because of the high prices that they command on account of the variety of ways in which they are employed and their world-wide consumption, are cultivated on a large scale, the most notable being: belladonna (of which the price has risen from about 7½ d. to 8s. 6d. per lb.), marshmallow, mallow, mullein, henbane, borage, chamomile, peppermint, valerian, aconite, balm, hyssop, sage, male fern, black current, horse radish, scurvy grass, parsley, coriander, angelica, small centaury, gentian, sweet marjoram. Attention is also directed to the cultivation of saffron and mustard.—Bull. Agr. Intelligence; through Chem. Abstracts 11 (1917), 3093.

Medicinal Plants.—*Collection in Germany.*—In several parts of Germany the local pharmacist has been requested to supervise the collection of medicinal and useful plants. In this the school children take an active part, the school being closed during part of the week for this purpose. M. Hengge reports that under his supervision 8 Cwt. of dried nettle-stalks, 10 Cwt. of berries of the white beam tree, and 6½ Cwt. of fruit kernels have been collected. The nettle-stalks are utilized for their fibers. The prospects of increased collection during 1917 are good, but the collection of fruit-kernels will be discontinued as not altogether satisfactory.—Apoth. Ztg.; through Pharm. J., 98 (1917), 365.

Medicinal Herbs.—*Cultivation in Germany.*—This industry is receiving official encouragement in Prussia and in Saxony. A Commission has been appointed to report upon it. Attention is drawn to the fact that improvements in agriculture are leading to the

cultivation of land upon which wild medicinal plants were growing and to maintain the supply of the latter it becomes increasingly necessary to cultivate them. The prejudice that formerly existed in the medical profession to cultivated plants, under the belief that they were less active, is disappearing; any such instances are due to unsuitable cultivation, and it should not be difficult to determine the best conditions for cultivation, when probably the active constituents would show an increase. One advantage of cultivation is that the plants can be collected at any given period of their development and another that they can be obtained free from admixture.—Pharm. Ztg.; through Pharm. J., 98 (1917), 375.

Drug Plant Cultivation.—*In Germany.*—E. Senft describes the shortage of supplies in Germany and the various substitutes for such commodities is coffee, tea, tobacco and soap. He then outlines the history of drug plant cultivation in Germany from the days of Charlemagne to the present period of war.—“Der Mörser;” through D.-A. Apoth. Ztg., 38 (1917), 113.

Drug Plant Cultivation.—*In Gothland.*—Lybing states that the island of Gothland is favorably situated, inasmuch as the climate is comparatively mild though dry. *Althæa officinalis*, *Atropa belladonna*, *Datura stramonium*, *Digitalis purpurea*, *Hyoscyamus niger*, *Papaver somniferum*, and *Valeriana officinalis* are among the plants cultivated. Five hundred poppy capsules gave 9 grammes of dried latex containing 4.6 per cent. of morphine. The cultivation of valerian root was very profitable; if the flowering stems are removed the root-system becomes strongly developed. A number of other medicinal plants were also cultivated experimentally.—Svensk. Farm. Tidskrift.; through Pharm. J., 99 (1917), 88.

Drug Plant Cultivation.—*In India.*—There are signs that the Government of India is awake to the importance of this subject. The various herb-growing associations have received popular support, and a careful organization has been formed with the object of producing drugs of a high standard, and affording suitable means of conveyance to selected centers. In March of this year, Major A. T. G. Gage, director of the botanical survey of India, said that given the necessary staff and equipment, it should be quite feasible to undertake the systematic cultivation of drugs in India. Dr.

David Hooper, of the Indian Museum, Calcutta, stated some time ago that one-half of the drugs of the British Pharmacopœia were indigenous to the East Indies, and nearly the whole of the rest could be exploited. Belladonna is grown in the western Himalayas from Simla to Kashmir; digitalis is extensively cultivated in the Nilgiri Hills in sufficient quantities to supply the demands of the Madras Government Medical Store Department; henbane is a native of the temperate Himalayas from 8,000 to 11,000 feet, and is now being cultivated in the botanical gardens at Foharunpur; ipecac has been introduced in several places; it is believed that with care and attention it can be produced on a commercial scale; jalap grows easily and quickly, and the supplies grown on the Nilgiris are sufficient to satisfy the greater part of the Indian trade.—Pharm. J., 99 (1917), 149.

Drug Plant Cultivation.—*In Switzerland.*—A. Tschirch discusses the following phases of drug farming: planning cultivation according to requirements of the plant and available conditions of climate and soil. (2) Proper selection of seeds or shoots. (3) Cultivation on a small scale not to be neglected; in all cases the sale of the product should be assured. (4) Judicious fertilizing. (5) Keeping out weeds. (6) Rapid drying at low temperatures, possibly on the co-operative plan. (7) Both economic and chemical control. (8) Centralization of the scientific study of the whole question in agricultural colleges.—Schweiz. Apoth. Ztg.; through Chem. Abstracts, 11 (1917), 3377.

BACTERIOLOGY.

Bacillus Phenologenes.—A. Berthelot describes a new phenol-forming organism, found in the excreta of patients suffering from chronic intestinal maladies, a form of these micro-organisms has been frequently isolated, which shows such distinctive characters that it is considered to be a distinct species. From its phenol-forming activity it has been named *Bacillus phenologenes*. It retains its great biochemical activity when cultivated in various media: even after several years it only shows a diminution of two-fifths of its original phenologic activity, and even then, cultivation in the presence of tyrosine is sufficient to restore it to its full phenol-forming vigor. It forms most phenol from levotyrosine, but it also produces it from racemic tyrosine, from glycyl-levo-tyrosine, or

from pancreatic peptones of flesh. When cultivated in media containing the products of peptic, ereptic, or pancreatic digestion, the various intestinal or gastric secretions, of albuminoids coagulable by heat, it forms about four-tenths the amount of phenol that it gives with pure tyrosine alone. In the tyrosine medium, the presence of 1 per cent. of bile or of other intestinal secretion or organisms does not affect the formation of phenol. Glucose, however, in any medium, arrests the phenol-forming power. *B. phenologenes* is practically anærobic; it may be cultivated in media almost deprived of air; but under these conditions, although it lives well, it does not form phenol. If it produces para-cresol, it is in such minute quantity that it cannot be detected. The bacillus is very resistant to the antiseptic action of phenol. It requires 6.8 per mil of that substance to be added to arrest its growth in peptone broth. This property enables it to be isolated from the accompanying *B. coli*. The discovery of this bacillus confirms Metchnikoff's theory of auto-intoxication from the products of the intestinal flora.—*Compt. rend.*; through *Pharm. J.*, 98 (1917), 139.

Gonococci.—*New Culture Medium for.*—D. Thompson recommends, as being free from the defects of cultures prepared from trypsinized pea-extract and blood-agar, the following medium: Prepare nutrient agar (2.5 per cent.) in the ordinary way with bouillon and White's peptone (1 per cent.), and render it +6 acid. Instead of, as usual, adding to this 0.5 per cent. sodium chloride, add all the salts natural to the human blood (as in Ringer's solution), namely: Sodium chloride, 9 Gm.; calcium chloride, 0.25 Gm.; and potassium chloride, 0.42 Gm. per liter. Add glucose, 2.5 per cent. The nutrient agar, with salts and glucose, is then tubed, about 4 mils being added to each tube. The sterile tubed agar is melted in boiling water, and after allowing it to cool to about 50° C., add 1 mil human plasma to each tube, and mix thoroughly by rolling the tube between the palms. Allow the medium to solidify in a sloping position. This method of obtaining human plasma is described in the article. Strong growths of gonococci can be raised on this culture medium.—*Brit. Med. J.*; through *Pharm. J.*, 99 (1917), 113.

Spirochæta Pallida.—*Soap and Water Fatal to.*—It is generally recognized that extragenital syphilitic lesions obtained innocently through the barbers' manipulations or utensils, are of relatively

rare occurrence. As the result of a number of experiments made by M. A. Reasoner, it is found that the organisms of syphilis will not live in the presence of soap solution, even when dilute. A lather, such as is used in shaving, is sufficient when brought into contact with them, to cause them instant death. It is possible that some of the syphilitic lesions, which have to be ascribed to the barber, may have been transmitted by a towel wet with water only, which has conveyed the infection from another person. It is possible that a solution of soap, or lather, would be of some value as a prophylactic against syphilis; but probably for several reasons not equivalent to the mercurial preparations now in use.—J. Am. Med. Assoc., 68 (1917), 973.

Spirochetæ.—*As Plants.*—E. Meirowski considers the nodules found by Huebner and Reiter on the spirochete of Weil's disease, which they named *Spirocheta nodosa*, to be true buds. Their presence is taken to demonstrate that the spirochetes belong to the vegetable kingdom, since true lateral branches are never found on the protozoa, while they are characteristic of the filamentous fungi. These nodules, when detached from the parent stem, correspond to Much's granules in tubercle bacilli. The author called attention to similar buds on *Spirocheta pallida* in 1914 but his views were not then accepted. The spirochetæ of Weil's disease and of syphilis as well as the bacilli of tuberculosis and of leprosy all pass through a granular phase. These granules can traverse a filter, which explains the fact that cultures, although filtered free from spirochetæ, are still virulent and reproduce syphilis when inoculated.—Med. Klinik; through Pharm. J., 98 (1917), 189.

Spirochetæ.—*Tolerance to Toxic Agents.*—Akatsu and Noyuchi cultivated pure cultures of *Treponema pallidum*, *T. microdentum*, and *Spirocheta refringens* in contact with gradually increasing doses of salvarsan, neosalvarsan, corrosive sublimate, and Lugol's solution. In three to four months the *Treponemas* showed an increased tolerance towards salvarsan and neosalvarsan, of 5.5 times their original resistance. *Spirocheta* showed an increased tolerance of about 3. *T. pallidum* showed an increase of tolerance to mercuric chloride of 35 to 70 times the original. *T. microdentum*, about 10 times; *Spirocheta* resisted the original dose for thirty weeks. There was a distinct increase of resistance towards

iodine with all three organisms, the ultimate tolerance being about three times that of the original quantity.—J. Exper. Med.; through Pharm. J., 98 (1917), 358.

Typhoid Bacilli.—*Toxic Action of Indol on.*—Rocek says that in high dilution, indol inhibits the growth of typhoid bacilli, and in concentrated solutions it is an active bactericide towards these organisms. Bacterium coli which produces indol normally, however grows luxuriantly in solution containing this substance. Typhoid stools which contain B. typhosus do not remain indol. It is suggested that typhoid may be treated by the administration of indol; but the author has been unable to try the remedy on the human subject. Experiments on animals indicate that daily doses of 0.5 gramme are not harmful.—Centralb. Bakt. n. Parasitenk.; through Drug. Circ., 61 (1917), 75.

Typhoid Bacilli.—*Search for.*—Dienert and Matthieu state that the divergent results often noted in making use of the malachite green method for separation of the typhoid group of bacilli from the coli group are due to the variation in composition of commercial malachite green. Whether or not a sample of this dye is suitable for the purpose intended may be ascertained as follows:

A 1 in 3000 solution of the reagent in peptone water is made. The para-typhoid bacillus should develop in this medium and should cause decolorization in 24 hours. In examining feces in this manner typhoid and para-typhoid bacilli were isolated in each case in which blood cultures showed their presence. In some cases both varieties were isolated when the blood examination showed presence of only one. The author calls attention to the fact that the water of the river Seine when examined by this method showed presence of para-typhoid bacilli.—Compt. rend.; through C. U. C. P. Al. J., 24 (1917), 63.

Bacteria.—*Germicidal Action of Ultra-Violet Rays on.*—By exposing films of organisms, growing on agar or gelatin plates, to the spectrum from tungsten arc C. H. Browning and S. Russ discovered that the germicidal action of the ultra-violet ray ceases abruptly at a wave length of about 2960 A. U. Experiments upon various organisms showed practically the same range of resistance

for the *Bacillus typhosus*, *B. coli*, *Staphylococcus pyrogenes aureus* and the meningococcus.—Chem. and Drug., 89 (1917), 556. (K. S. B.)

Bacteria.—*Control of Intestinal.*—Hall and Rettger finds that the direct feeding of bacterial cultures has almost no influence on the nature of the growths even when preceded by immunization. The significant factor is food. Carbohydrates when substituted for proteins in the diet inhibit intestinal putrefaction. Organisms of the *B. coli* and *B. welchii* type tend to disappear, and increase of those of the lactic acid type is apparent after the inclusion of large quantities of milk in the diet. The lactose of the milk is the most important factor in this change. Lactose feeding invariably causes the establishment of aciduric or lactic acid organisms such as *B. acidophilus* and *B. bifidus* in the intestines. Other carbohydrates have but little effect. Lactic acid is not a factor but lactose as such is the nutrient needful for the growth of these organisms. A combination of milk and lactose forms the most practical and effective diet for this purpose.—J. Bacteriol.; through Pharm. J., 98 (1917), 353.

Bacteriological Culture Medium.—*A Substitute for Nutrose.*—A mixture of 94 per cent. of peanut flour, 5 per cent. of casein and 1 per cent. of sodium carbonate may be used to replace nutrose in bacteriological cultures.—Chem. and Drug., 89 (1917), 917. (K. S. B.)

GENERAL BOTANY.

Botanical Nomenclature.—*Confusion.*—When is syringia not syringia? When is cedar juniper? Did Socrates die of the hemlock tree (*Pinus* or *Abies* or *Tsuga*) or the hemlock herb or seed (*Conium*) or the water hemlock or cowbane (*Cicuta*)? If *Cicuta* is cowbane, how can *Oxypolis* be cowbane? And is *Conioselinum* called hemlock parsley because it is neither hemlock nor parsley—or why?

Chimaphila maculata is not overburdened with Latin synonyms. Linnæus assigned it to the genus *Pyrola*, but Pursh's name *Chimaphila maculata* has been in use for over a century. Some authorities give the English names Pipsissewa and Prince's pine and others "spotted wintergreen." In this case this wintergreen is not a win-

tergreen. For all of our eight American species of *Pyrola* are called wintergreen—except when one of them is named shin-leaf. And then there is *Gaultheria*, a quite distant cousin—not even included in the wintergreen family by the latest systematists. There are two more wintergreens not at all related to the foregoing, *viz.*, chickweed wintergreen (*Trientalis Americana*), also known as star-flower, belonging to the primrose family, and flowering wintergreen (*Polygala paucifolia*) called fringed milkwort or gay-wings belonging to the milkwort family.

The article closes with a delightful story of how a French translator of Cooper explained the passage “he hitched his horse to a locust” by stating that in America the locust was an insect of enormous size and that when filled with lead, they served as hitching posts.—*Sci. Am.*, Aug. 11, 1917, 94. (O. R.)

Botanical Nomenclature.—*English Names.*—J. Adams has recently put forth a suggestion which is so obvious and important that one finds it difficult to understand why it was not made the subject of an active propaganda long ago. Botanists and others interested realize that the popular nomenclature of plants in this country is in a state of chaos. The same species bears in many cases a score or more of different names, and, conversely, the same name is in many cases to a great number of different species. Mr. Adams urges that a provisional list of English names of species be adopted for the United States and Canada without waiting until all the fine points in taxonomy are settled. The English name should be applied to aggregate rather than to segregate species; thus Pipsissewa or Prince's Pine should be regarded as the name of both *Chimaphila corymbosa* Pursh. and *C. occidentalis* Rydb., the two species into which *C. umbellata* Nutt. has been divided in the “North American Flora.”—*Sc. Am.*, Sept. 8, 1917, 171. (O. R.)

Chinese Beverages.—*Flora of.*—Takahashi and Yukawa state that Shaoshing-chu or Lau-chu is one of the most popular beverages in China. “Shaoshing” is derived from the name of a town, “chu” meaning alcoholic drink and “lau” old because this beverage is stored a very long time for the purpose of aging. In the mash of this drink have been found eight new varieties of *Saccharomyces*, four new varieties of *Zygosaccharomyces* several of *Willia anomala*, one of *Mucor* and *Chalara*, and some bacteria. “Shoyu-koji” is prepared by methods similar to those for “sake-koji,” but steamed

soya-bean and roasted wheat are used instead of rice. Shoyu-moromi, the soya-mash, is prepared by mixing "shoyu-koji," common salt and water in certain proportions. Four new specimens of *Zygosaccharomyces*, and one of *Monilia* have been found in this beverage.—J. Coll. Agr. Imp. Univ. Tokyo; through Pharm. J., 98, (1917), 405.

Cotyledons.—*Non-essential.*—Some interesting experiments carried out with kidney beans or *Phaseolus vulgaris* prove that although the cotyledons are helpful in the development of the baby plant, they cannot be considered essential as the youngster can develop without the starch stored away in the lobes. Three beans were selected for this test. The first was sown without any interference, in the second the cotyledons were halved and in the third case the cotyledons were entirely removed, save only a tiny portion that adhered to the embryo. All the beans were sown under similar conditions. Germination in the case of the untouched bean was much slower, but the plant became the largest of the three. The bean without cotyledons was a little plant almost before the normal specimen had properly germinated. It seemed as if the embryo realized that it had no food supply to draw upon and must therefore get its leaves and roots developed at the earliest moment. Plant No. 3 remained the smallest and No. 2 was medium sized. But in both cases where the cotyledons had been mutilated the plants were perfectly healthy proving that the cotyledons are not by any means essential to the growth of the young plant. Six illustrations accompany the article.—Sc. Am., Oct. 27, 1917, 315. (O. R.)

Nectar Secretion and Environment.—L. A. Kenoyer finds that the increase of water supply may increase the secretion of water from the nectaries, but does not increase the amount of sugar secreted and lessens the sugar surplus in the parts of the flower. The rate of secretion of both water and sugar increases with rise in temperature up to a certain optimum, after which it varies inversely as the temperature. The optimum condition for sugar secretion is an alternation of high and low temperatures. Darkness diminishes sugar secretion by decreasing the food reserves of the plant. Accumulation of sugar in and near the flower and its secretion by the nectaries is most pronounced early in the blooming season.—Bot. Gaz.; through Pharm. J., 99 (1917), 123.

Plants and Illuminating Gas.—C. Wehmer states that from his observation it is established that illuminating gas exhibits no general poisonous properties toward plants. Anærobic fungi were found to grow in the undiluted gas, and cress seeds (*Lepidium sativum*) remained alive in it for weeks. The undiluted gas retards the growth of the embryo, but such growth goes on without interruption if the gas be diluted with about 5 volumes of air. Wehmer comes to the conclusion that gas cannot be classed as an acute plant poison but that if allowed to pass through soil for an extensive period, the latter becomes incapable of supporting plant growth. If such soil, however, is extracted with cold water, it again behaves normally toward seeds, the water extracting the substances which are injurious. It is stated that the principal constituents of ordinary illuminating gas to which its action on plants is due, are compounds of sulphur, benzene and homologues, and perhaps ethylene. Carbon monoxide reacts indifferently towards plants.—Ber. Dtsch. bot. Ges.; through C. U. C. P. Al. J., 24 (1917), 176. (G. C. D.)

Plants and Illuminating Gas.—S. L. Doubt states that the increasing loss of plants in greenhouses and trees in streets in American towns is attributed largely to coal gas poisoning. From their sensitiveness in this respect tomato plants, *Salvia splendens*, *Mimosa pudica*, *Ricinus communis*, *Datura stramonium*, and *Dianthus caryophyllatus* are recommended as test plants. In all these, except the carnation, 50 parts of coal gas per million of air cause epinastic growth of petioles; and the flower buds of carnations wither in this degree of atmospheric gas pollution. A dilution of gas 1 : 1000 causes the leaves of all these to fall off, as well as from *Coleus*, and *Hibiscus rosa sinensis*. Ethylene alone gives similar results. The following plants are found not to be affected by concentration not exceeding 1 : 400 of illuminating gas in air, which is the smallest amount that can be detected by smell: *Calladium esculentum*, *Lupinus perennis*, *Eriobotrya japonica*, *Phoenix canariensis*; *Conocephalus* sp., *Canna*, *Achyranthes lindini*, *Alternanthera* sp., *Cystisus canariensis* and species of *Polypodium*. Many trees, including elder, ash, elm, lime, and catalpa, are very sensitive to gas escaping into the soil. Simple tests are detailed by means of the above-named gas-sensitive plants to detect small amounts of gaseous contamination.—Bot. Gaz.; through Pharm. J., 99 (1917), 111.

Plant Roots and the Soil.—*Mechanism of Exchanges between.*—P. Mazé finds that the absorption of nutritive solutions by the roots of plants is regulated by the mobile protoplasm of the root-hairs, and is dependent on the chemical energy produced within the plant. It is not dependent upon a mechanically regulated osmotic action, for osmosis is observed only in dead organic structures. The exchanges are possible only when the nutritive medium contains all the elements needful to the plant. Solutions lacking some constituent, and distilled water, introduced directly into the vascular bundles, act as poisons. In sufficient concentration, these dissolved substances cause plasmolysis of the cells. This is a coagulation phenomenon, since osmotic pressure does not act between the living cell and an external medium. A mechanical pressure acting on the root-hairs and favoring the accumulation of sap in a plant in a state of repose is impossible for the same reason. The absorption of sap is regulated by the chemical activity of the plant, and it is the imbibition, aided by atmospheric pressure, which assures its rise. The circulation of the elaborated sap is accomplished by the pressure of turgescence of the assimilating cells, so that the synthetic materials are carried to all parts of the plant, through a system isolated from the ligneous vessels by the protoplasm which forms the walls of the tubes. The nourishment of the different parts of the plant is thus assured without the interference of the crude with the elaborated sap. This pressure is periodical, occurring only during darkness.—Am. Inst. Pasteur; through Pharm. J., 98 (1917), 65.

Chlorosis in Plants.—According to P. Mazé, chlorosis in plant is not due entirely to a lack of iron. A deficiency of manganese, magnesium or sulphur may produce the same results. Chalky soil holds back the iron salts producing chlorosis and the addition of a solution of iron helps. The condition is not so readily helped when the chlorosis is due to a lack of magnesium.—Comp. rend. Soc. biol.; through Am. J. Pharm., 89 (1917), 127.

Medicinal Plants.—*Use in Decorative Art.*—E. Kremers describes the work of Miss Oehler, teacher of art at the Madison high school in utilizing the leaf, stem, flower bud, full blown flower and capsule of *Datura* as decorative art motifs.—Rep. Wis. Pharm. Exp. Station; through J. Am. Pharm. Assoc., 6 (1917), 375.

Plant Textures.—Taking as text, the beautiful passage “consider the lilies of the field, how they grow,” J. U. Lloyd discusses with the purest of diction and with most delightful poetic imagery the marvels of nature hidden within the lily structure. Beginning with the beauty of the flower itself he discusses the greater beauty of the histology of its rhizome and the marvelous mechanism of its protoplasm. He then turns to the most marvelous phase of all the Brownian movements of the colloidal particles of its fresh juice as revealed by the ultra-microscope.—*Am. J. Pharm.*, 89 (1917), 387.

Roots.—*Hormone Theory of Formation.*—J. Löeb's experiments on curvatures induced in stems of *Bryophyllum calycinum*, with and without a single leaf left on near the base or apex, lead to the suggestion of shoot and root-forming substances secreted by the leaf and passed upwards to produce leaves and downwards to produce roots. A specific substance (a hormone) for the production of geotropic growth is suggested as being associated or identical with root-forming hormone in some plants and with the shoot-forming hormone in others. On this hypothesis the fact that in certain firs a horizontal branch becomes vertical and takes over the functions of the apex of the tree, when the tree is decapitated, is explained by the flow of the (still hypothetical) geotropic hormone into the branch nearest the apex instead of the apex as normally.—*Bot. Gaz.*; through *Pharm. J.*, 99 (1917), 111.

Seeds.—*Viability of.*—J. F. Groves has studied the longevity of wheat seeds containing known percentages of moisture at known temperatures, and high temperatures (from 55° C. to 92° C.) are found to have marked shortening effect on the life of the seed, which effect increases with the percentage of moisture present. Other workers have found that 25 per cent. of wheat would grow after being stored for 8½ years under normal conditions with normal percentage (about 12 per cent.) of water present.—*Bot. Gaz.*; through *Pharm. J.*, 99 (1917), 123.

GEOGRAPHIC BOTANY.

Ceylon Products.—Among the Ceylon exports during 1916 were 123,305 Cwt. of areca nuts, 313 Cwt. of papain, 261 Cwt. of nux vomica and 9,173 of cinchona.—*Chem. and Drug.*, 89 (1917), 349. (K. S. B.)

Dyes.—*Indigenous in India.*—J. P. Serivaslava in a timely paper "Dyeing Values of Some Indigenous Dye-Stuffs," in the *Agricultural Journal of India*, mentions the following, which have been classified by the abstractor.

Yellow: Harsinghar, the flowers of *Nyctanthus arboreus*; Tun, the flowers of *Cedrela toona*; Haldi, the rhizome of *Curcuma longa*; Arusa, the leaves of *Adhatoda vasica*; Naspal, the rind of *Punica granatum*; Jangli Nil, the leaves of *Tephrosia purpurea*; Kusum, the flowers of *Carthamus tinctorius*; Roli, the hairs of *Mallotus philippinensis*; Kathal, the wood of *Artocarpus integrifolia*; the wood of *Rhus cotinus*.

Brown: Tesu or Dhak, the flowers of *Butea frondosa*; Cutch or Katha, the extract of *Acacia catechu*; Akhrot, the bark of *Juglans regia*.

Blue: Indigo.

Scarlet: Lac dye.

Pink: Peepul, the root of *Ficus religiosa*.

Red, crimson or purple according to strength and mordant: Majibh, the root and twigs of *Rubia cardifolia*; Patang or Sappan, the wood of *Caesalpinia sappan*; Kachnar, bark of *Bauhinia racemosa*; Red Sanders, the wood of *Pterocarpus santalinus*.—*Sc. Am. Supp.*, Nov. 10, 1917, 294.

Medicine in Morocco.—An abstract of an article by A. Tacquin in the *British Medical Journal*. Of the native physicians many hold diplomas from masters at Fez who have judged them qualified. They are mostly itinerant, installing themselves in the market places of the towns visited. The principal diseases are those common to temperate climates and tropical diseases are almost unknown. Native therapeutics are entirely empirical but the materia medica includes many drugs in universal use. Prescriptions are very complex as regards number of ingredients and are usually old recipes transmitted from past generations. Simple organotherapy is practiced. The use of arsenic as a criminal poison is very prevalent. Hyoscyamus is used as a narcotic and somnifacient in operations. Supernatural and shrine-cures are much in vogue.—*Pharm. J.*, 98 (1917), 285. (C. W. B.)

Seychelles.—*Produce.*—During 1916 Seychelles exported 20,941 kilos of vanilla (the largest export since 1910) against 2,470 kilos in 1915; 190 hectoliters of essential oils, against 102 hectoliters in

1915; whale oil, to South Africa, 7,000 liters, valued at Rs. 21,000; copra, 2,914,908 kilos, against 2,369,908 kilos in 1915.—Chem. and Drug., 89 (1917), 866. (K. S. B.)

DRUG COMMERCE.

Conserving Life by Eliminating Waste.—R. P. Fischelis urges that pharmacists must use great care or our country may be in need of drugs and biological products that are necessary to the health and life of both civilians and soldiers. Drugs have been commandeered in foreign countries and unless pharmacists are equal to the situation themselves the United States may be forced to do likewise.

There has been inexcusable waste in biological products due to careless ordering and subsequent return of outdated packages. It matters little who bears the loss; the waste is what concerns us now, and aside from the product itself, rubber, metal, glass, wood, paper, dyes, other chemicals, time and labor are wasted. In pharmaceuticals there is waste due to overstocking either in quantity or in variety and consequent deterioration.

Hoarding is never good business, and now it is morally wrong. The time has come for us to cease to think "as individuals and consider the significance of multiplication of individual wastefulness and carelessness." Doing our bit "means more than flying the American flag" over our stores.—J. Am. Pharm. Assoc., 6 (1917), 904. (Z. M. C.)

Chemical Products from the Forest.—Dr. A. W. Schorger states that the forests contribute annually over 4 million cords of wood as raw material to the pulp and paper industry, over a million cords to the hardwood distillation industry, over a million cords of bark and nearly a million barrels of extract to the tanning industry, nearly five million barrels of crude gum to the naval stores industry, besides raw material for the many smaller chemical industries.

The United States has naturally occupied a preëminent position in several of the forest products industries by reason of her unusual resources, but this position can be improved by progressive and aggressive development of the industries. About 75 per cent. of the world's supply of naval stores are produced in the Southeastern States from virgin stands of long leaf and Cuban pine, which are fast disappearing. Most of the acetone used in the arts

is made from the acetate of lime obtained in the process of hard wood distillation, and has valuable solvent properties for the manufacture of explosives, certain of which are practically dependent upon this solvent alone. Wood and methyl alcohol and formaldehyde are other very important distillation products. Douglas fir turpentine has proved to be an excellent substitute for the scarce Venice turpentine. Osage orange wood greatly resembles fustic in its dyeing properties. The chemical products from the forest and quite especially the products from the destructive distillation of hardwoods are absolute necessities and the importance of the industry makes independence of foreign supplies imperative.—Sc. Am., Sept. 8, 1917, 173. (O. R.)

Plant Products.—*Scientific and Commercial Study of.*—The Committee on Botanical Raw Products of the Council of National Defense serve as a clearing house. Its activities are grouped under the following 10 headings:

1. The collection of agricultural, botanical and commercial data on all plants having an economic use aside from that as food.
2. Dissemination of such information among manufacturers.
3. Investigation of requirements of the trade for raw materials.
4. Discovery of new geographic sources of plants.
5. Development of plants by cultivation.
6. Investigations of the true value of conventional equivalents.
7. Discovery of new substitutes.
8. Investigation of the requirements of the trade for new raw materials.
9. Suggestion of new species for trade requirements.
10. Suggestion of new bases for known botanical raw products.

The Committee appeals to all who can furnish data of value to communicate same to the Bussey Institution, Forest Hills, Mass. In such an extensive work as this every item counts, and what seems to be the most commonplace thing in the world may be just what the Committee needs to round out its information in some critical region of the industrial field.—Sc. Am., Sept. 15, 1917, 190. (O. R.)

Substitutes for Domestic Plants.—One of the projects outlined by the Committee on Botany of the National Research Council is the search for wild plants, to be used as wartime substitutes for the more costly crop plants. During the Civil War Dr. John Porcher published a book giving a list of wild plants of the South

which could be substituted for much needed food and drug plants. The American Botanist, of Joliet, Ill., proposes to compile a similar list. Information is sought as to any plants having food or medicinal value.—Sc. Am., Sept. 8, 1917, 171. (O. R.)

War Botany.—In a lecture delivered before the German Pharmaceutical Society. A Tschirch stated that the production of a sufficient quantity of food is essentially a botanical problem, as meat is only vegetable food converted by animals into a suitable form. The conditions in Germany are particularly favorable for such production, as it contains large agricultural areas, possesses abundance of potassium salts, and manufactures large quantities of artificial manures. In times of peace very large quantities of the press-cakes of tropical seeds and fruits were imported; these were of great importance, as seeds store up in small compass abundance of the most valuable nutritive substances, *viz.*, fat, proteids, carbohydrates, organic phosphorus compounds, and salts. It is therefore necessary for blockaded countries to discover whether the indigenous flora is capable of supplying the deficiency. The author thinks this can be done in the first place by increasing the cultivation of the poppy, hemp, flax, and rape; other sources are to be found and utilized in the seeds of various cruciferous plants, and also of sunflowers. An increase in the production of sugar could be effected by increasing the production of sugary fruits; thus, in Switzerland, the cultivation of raspberries in districts in which the vines had been abandoned had been found to be exceedingly profitable. Diminution of the quantity of meat consumed the author considers to be a blessing in disguise, more especially as it has directed increased attention to the value of wild indigenous plants, such as dandelion, cress, etc. An extension of the cultivation of peas and beans is to be recommended, and the drying of such vegetable foods is extremely desirable.

The utilization of the results of scientific researches may have a profound influence on the development of an industry. It is only since the outbreak of war that Germany has introduced, with brilliant results, a scientific method of tapping pine trees for turpentine, and thus the prospects of Germany being able to make herself independent of Japan for her supply of camphor are materially improved. The commercial production of rubber from indigenous material, is not probable, but in this case the day is not far distant when isoprene, the source of synthetic rubber, will

be much more abundantly obtained. A very important fact for Germany is that she is not cut off from opium supplies, while the synthetic production of purine bases allows of the addition of these to coffee and tea substitutes which do not possess the desired stimulant action.

The supply of tropical vegetable fibers can be dispensed with, as hemp, flax, nettle, hop, and other indigenous plants produce fibers in abundance.

The war has also directed attention to the oft-repeated warnings of experts, that more attention should be directed to the collection of indigenous medicinal plants, and that the cultivation should be organized on a scientific basis. The advance that has of late years been made in our knowledge of the chemical constituents of drugs has facilitated the discovery of substitutes for those now not available in Germany. Thus alder-buckthorn bark can replace rhubarb and cascara sagrada. Cassia obovata, long cultivated in Spain, can replace senna. The whortleberry is an unrivalled astringent, and it is certain that the conserves made of quince, currants, elder berries, juniper berries, barberry fruits and others, have not been used for centuries without good reason. In countries where *Digitalis purpurea* does not grow *D. ambigua* offers an efficient substitute. *Strophanthus* can be replaced by *Convallaria*, *Scilla*, *Adonis sarothamnus*, *Nerium*, and *Helleborus*; bitter almonds, by cherry, plum, quince, and apple seeds; *Equisetum* and *Plantago coronopas* are excellent diuretics. The indigenous flora contains abundant treasures, and foreign drugs have too long been preferred to those that are indigenous. The cultivation of medicinal plants will yield the most valuable results if conducted under constant chemical control. This can best be done by the addition to the agricultural stations of drug-plant departments under the supervision of pharmacists.—Schweiz. Apöth. Ztg.; through Pharm. J., 99 (1917), 38.

BIOLOGY.

Acids.—*Excretion by Roots.*—Using phenolsulphonaphthalein as an indicator with accurate control solutions and quartz apparatus, Haas has obtained results with corn and wheat which show that no acid or acid-producing substance other than CO_2 is excreted by living roots.—Proc. Am. Acad. Sci.; through Pharm. J., 98 (1917), 337.

Plant Health.—*Effect of Acidity, Alkalinity and Nitrogen of Soils on.*—O. Comes finds that soil water with a slight acidity facilitates the growth of plants. Soils with an alkaline reaction facilitates the drying up of oat leaves, scurf in potatoes, foot rot in wheat, chlorosis in American vines, and other parasitic diseases. Limestone soils cause a greater production of sugar in plants and prevent the formation of free acids. The addition of alkali to soil renders the plants more sensitive to external injurious influences: acid fertilizers have a contrary effect. Resistance of plants to adverse conditions is greater in loose soil than in compact. Stagnant subsoil water causes asphyxia of roots, by gradually impoverishing the oxygen content. This is followed by necrosis of the tissues which is favorable to the growth of mycelia. The greater hardiness of wild plants is due not only to the greater density of their tissues consequent on the small supply of nitrogen in the compact soil in which they grow, but to a greater degree to the acidity of their tissues. The application of nitrogen fertilizers renders plant tissues more juicy, and therefore more sensitive to bad weather; they are also richer in sugar, consequently more attractive to animal and vegetable parasites. The richer the soil is in nitrogen the shorter is the incubation period of vegetable parasites, and cultivated plants show an increased receptivity to the bad effects of all parasites. Sodium nitrate renders a plant more sensitive to adverse factors. Excessive nitrogenous manure prolongs the growing period of the plant and retards lignification. Consequently the foliage is more sensitive to cold. As a general prophylaxis for cultivated plants against diseases the use of phosphatic fertilizers, assisted by sulphate is advised.—Pharm. J., 99 (1917), 123.

Plant Cells.—*Acidity of.*—A. R. Haas states that it is a widely accepted idea that the reaction of living cells must be neutral, or nearly so, in order that life may go on in a normal manner, but, using solutions in which the concentration of the hydrogen is accurately known, and designated by the negative common logarithms (thus:—H-ion conc. = $1 \times 10^{-7.5N}$ gives a P_h number + 7.5), quite a number of plant cells have been found to show an acid reaction with natural indicators. The method consists in decolorizing an alcoholic or aqueous extract of the anthocyan pigments with solutions of known P_h . The acidity found varies from $P_h + 3$ to $P_h + 8$ and the following material was used: Petals of sweet-pea, pansy, *Primula obconica*, *P. chinensis*, hyacinth, *Ci-*

chorium intybus, Scilla, Pelargonium, red cabbage leaves, cranberry juice and red beet-root juice.—J. Biol. Chem.; through Pharm. J., 98 (1917), 375.

Carbon Dioxide.—*Detection of Traces in Plant Respiration.*—A. R. Haas finds that this is important in studying the respiration of plants and aquatic animals. The reagent used is phenolsulphonaphthalein, which has a range of color from $P_h + 6.5$ to $P_h + 8.5$ and extremely sharp differentiation in color between $P_h + 7.0$ and $P_h + 7.5$. Using control solutions of known acidity, it is possible to detect changes in the hydrogen concentration as small as from 2×10^{-6} to 1×10^{-6} . The organisms are placed in the solutions and the color changes observed. Results can frequently be obtained in five minutes.—Science; through Pharm. J., 98 (1917), 375.

Seaside Plants.—*Cause of Asymmetric Shape of.*—J. Dufrénoy finds that the asymmetry of plants growing by the sea is not wholly due to the wind nor does it wholly explain the direction of the growth observed. It is found to be chiefly due to the necrotic action of the salt deposited by the spray-carrying winds. Leaves become dotted with yellow spots, which ultimately become brown. These are covered with a white powder composed mainly of chlorides, and are found only on the exposed parts of the plants. Commencing in the neighborhood of the stomata, the necrosis spreads until the entire organ withers and growth is checked. But this destroyed portion forms a protecting barrier, in the lee of which young, vigorous shoots spread out landward. These phenomena have been observed with *Pinus pinaster*, *Eryngium mare*, *Sarothamnus scoparius*, and a number of other littoral plants.—Compt. rend. Soc. biol.; through Pharm. J., 98 (1917), 453.

Biophotogenesis.—R. Dubois gives a review of his own and others' work on the production of light by living organisms. This function is due to a glandular secretion which furnishes the light-producing products. The light produced is "cold light." It contains practically no heat rays and very few chemical rays. Its rays are longer than the average rays of the solar spectrum. It is produced by the action of an albuminoid oxidase, luciferase, on another albuminoid, luceferin. Luciferase is not destroyed by a

1 per cent. solution of sodium fluoride; it is not, therefore, a cellular or micro-organized substance. It passes through filter paper readily and through porcelain filters slowly. It does not dialyse. It energetically decomposes hydrogen dioxide. Heat increases its photogenic activity up to $40^{\circ}\text{C}.$, but it is destroyed at $60^{\circ}\text{C}.$ It resists cold, its aqueous mixtures with luceferin shine at $-5^{\circ}\text{C}.$, but less brightly than at $0^{\circ}\text{C}.$ Neutral salts and sugar in strong solution suspend without destroying its activity, which is recovered on dilution with water. It is decomposed slowly by formalin, chloroform, and ether, and strong alcohol precipitates it. Luceferin resembles a natural albumin. It gives light when treated with oxidizing agents, as well as with luciferase, but more readily with the former if first moistened with hydrogen dioxide. The process of biophotogenesis is not one of direct, but of indirect, oxidation, in which the luciferase acts as the carrier of oxygen to luceferin. Luceferin and luciferase may be preserved either separately or together by means of strong solutions of salts, or of sugar.—Rev. Gen. Sci.; through Pharm. J., 98 (1917), 189.

MICROSCOPY AND HISTOLOGY.

Vegetable Drugs.—*Identification by Use of a Micro-analytic Key.*—Albert Schneider presents a key based upon the microscopic structure of drugs for their identification. The use of the key presupposes a knowledge of vegetable tissues, tissue elements and formed cell contents. The histological characteristics of more than two hundred vegetable drugs are given.—Pacif. Pharm. 10 (1917), 177 and 183. (C. M. S.)

Molds.—*Detection in Drugs and Foods by the Chitin Reaction.*—A. Viehoveer discusses the detection of mold in food products and states that the simplest and most reliable test is based upon the fact that all fungi contain chitin; that this can be converted on heating with alkali into chitosan; and that this gives a characteristic color reaction with iodine and sulphuric acid.

Viehoveer's method is to boil the suspected sample for 40 to 60 minutes with 50 per cent. sodium hydroxide solution; to wash the residue free from alkali; to treat it, after washing, with a solution containing 2 parts of iodine, 1 part of potassium iodide and 200 parts of water. The sample thus treated is then introduced into 1 per cent. sulphuric acid, when a red to violet color is produced if

chitin was present in the original sample.—J. Am. Pharm. Assoc., 6 (1917), 518.

Textile Fibers.—*Use in Qualitative Microscopic Analysis.*—Chamot and Cole find that by the use of fibers of silk, purified by boiling with a 2 per cent. soap solution and then dyed with an aqueous solution of "neutral" litmus pigment, a sensitive indicator for acids and alkalies is obtained. Viscose silk fibers dyed with alkaline congo red may be used for the determination of acidity. Litmus fibers so prepared were found to react with mineral acids in dilutions amounting to N/4500. With acetic acid the limit is N/100. Using red litmus fibers, ammonium, sodium and potassium hydroxides will show a color change in N/200 solutions.

A loop of platinum wire 3 Mm. in diameter will deliver a drop of from 0.145 to 0.150 mil. If the solution to be tested is diluted quantitatively until the last dilution fails to change the color of the indicator on the fiber, a simple calculation will give the concentration of acid in the original solution.—J. Ind. Eng. Chem., 9 (1917), 969. (G. D. B.)

PHARMACOLOGY.

Antiseptics.—*Irregularity.*—Lactic fermentation, in presence of various antiseptics, and under identical conditions, shows varying acidity, says Richet, Cardot and Rolland. With sodium fluoride the variation is less than the control tubes, but with mercuric chloride the average variation is ten times that of the control tubes.—Chem. and Drug., 89 (1917), 556. (K. S. B.)

Antiseptics.—*Comparative Action of Pus and on Pure Cultures.*—The activity of some antiseptics in treating wounds is liable to be considerably decreased because, as Lumière has shown, these combine with the albuminoidal substances of the pus. Phenol, hermophenyl (sodium-mercury phenol disulphonate) and sodium hypochlorite solution were allowed to act on pus, containing chiefly white staphylococci, on a dilution of this pus, on a culture made of it, and on a pure culture of staphylococci. It was found that the activity of phenol was not influenced by the albumin of the pus, that that of hermophenyl was slightly decreased, while that of sodium hypochlorite had lost considerably. For the treatment of

wounds, therefore, comparatively concentrated solutions of hypochlorites must be used.—Compt. rend.; through Drug. Circ., 67 (1917), 189.

Antiseptics.—*Relationship between Capacity for Killing and Retarding Germ Growth and Valency.*—Friedberger and Joachimagic report that the toxic effect of trivalent arsenic compounds (sodium arsenite and salvarsan) in bacteria and protozoa is greater than that of the quinquivalent compounds (sodium arsenate and atoxyl). Trivalent antimony compounds (tartar emetic) similarly act more toxic than quinquivalent compounds (potassium pyroantimoniate). The action of yeast is inhibited to a greater extent also by arsenites.—Biochem. Zeitschr., 79 (1917), 153; through J. Chem. Soc. Abs. (A. V.)

Antiseptics.—*War.*—L. Gershenfeld discusses the new antiseptics, particularly those which have been introduced since the outbreak of the war.

The author divides these antiseptics into two classes, the Chlorine group and the class of By-Products. Formulas are given for the preparation of Dichloramin-T, Chlorinated Eucalyptol, Chlorinated Paraffin Oil and Chloramin-T Paste.

The use of the flavine group of dyes and the brilliant green as well as the malachite green are considered in detail.—Am. J. Pharm., 89 (1917), 487. (I. G.)

Chemiotherapeusis and Shock.—Dr. J. E. R. McDonagh states that the shock following intravenous injections of the chemiotherapeutic products, *e. g.*, colloidal aluminium hydroxide, and the organic arsenic products now in use, may be of two kinds: (1) cardiac, (2) pulmonary. The first is the more frequently met with, and may end in death. In the mild cases, pituitrin, ether, camphor and adrenaline hasten recovery, but in the severe cases these drugs appear to be valueless. If pituitrin or adrenaline is injected before the arsenic compound, then shock may be avoided. In severe shock, and, indeed, in all cases of shock, the wisest plan is to inject intravenously as soon as possible 10 mls of a 2.5 per cent. solution of calcium chloride. Dr. McDonagh never gives an intravenous injection of an arsenical compound unless he has ampuls of a sterilized solution of calcium chloride handy.—Brit Med. J.; through Pharm J., 98 (1917), 392.

Digestants.—At a “get-together meeting” of the Bronx County Pharmaceutical Association, Jacob Diner discussed the subject of digestion and gave typical prescriptions for the relief of various forms of indigestion.—Pract. Drug., Jan. 1917, 30.

Disinfection.—*By Fumigation.*—Kingzett, Bottomley and Brimley describe experiments made to prove that fumigation is an effective means of disinfection, an assertion to the contrary having been made by an American health officer. The new research establishes the efficacy of disinfection with sulphur dioxide gas, particularly when generated in association with aqueous vapor. It was found unnecessary to employ complicated apparatus for the generation of formaldehyde under pressure, paraform being equally efficacious for the purpose, and more convenient.—Med. Press; through Pract. Drug., Dec. 1917, 38.

Disinfection.—*Facts and Fallacies in.*—H. C. Hamilton finds that formaldehyde, when the gas acts in an aqueous solution, is an efficient disinfection, and is probably the only generally applicable fumigant. Mercuric iodide with potassium iodide is an exceptionally valuable germicide for the skin, and for disinfecting surgical instruments. Its germicidal value is 5,000 greater than that of phenol. Lime water from good lime has a high germicidal value, but its objectionable features render its use less widely practicable. Soap can be considered only to be a vehicle for an active germicide, or as an aid to disinfection. Most disinfectants, with the exception of mercuric potassium iodide, add but little to the efficiency of soap. Alcohol used on the skin, previous to washing with soap and water, is a highly efficient germicide if used at the strength of 30 per cent. or over. Coal-tar disinfectants should be standardized on their phenol coefficients. Pine oil and similar disinfectants require to be carefully standardized. Certain aniline dyes give promise of practical value in wound treatment, and as internal antiseptics, on account of the selective affinity they show towards certain micro-organisms, and because of their low toxicity to normal tissue. Probably the old dependable germicides, mercuric chloride, phenol, iodine, and hydrogen dioxide will never be displaced, but, undoubtedly, their field of usefulness will become more restricted.—Am. J. Pub. Health; through Pharm. J., 98 (1917), 453.

Dyspepsia.—*Hot Drinks as Cause.*—The practice of drinking hot liquids, which is stated to have become much more prevalent in France in recent years, is considered to be a cause of dyspepsia. Manquat states that 80 per cent. of his patients suffering from indigestion during recent years have been accustomed to drinking very hot beverages. In the case of infants, dyspepsia has often been traced to the practice of giving them hot milk with coffee or chocolate in the morning and at night. Frequently these fluids may have a temperature of 140° to 150° F. (60 – 70° C.), temperatures which do not cause serious discomfort in the mouth during the brief passage through that part. Undue heating of the stomach, especially when empty, is unavoidable by the more prolonged contact. Long-continued use of very hot liquids brings about gastric hyposthenia, doubtless due to chronic gastritis. No doubt the use of hot drinks, at a prescribed time and temperature, may be of therapeutic value, since Linossier has shown that they provoke an active secretion of hydrochloric acid; cold water is even more active in this respect. Tepid water at about 99° to 100° F. (37° C.) is less active than either. Consequently tepid beverages should be prescribed for hyperacidity and hot or cold drinks for those whose acid secretions are deficient. Apart from this influence, very hot liquids cannot be drunk without at the same time swallowing air. They must be gulped. Since ptyalin loses much of its activity at 113° F. (45° C.) and pepsin becomes inactivated towards 140° F. (60° C.), these digestive ferments must have their activity impaired by the practice. When dyspeptics abandon their habit of consuming very hot drinks, an amelioration of their condition follows almost invariably.—J. pharm. chim., 15 (1917), 332.

Eye Diseases.—*Topical Applications for.*—C. Ellbert Hoffman supplies a number of original formulas for preparations which are to be used by the practicing ophthalmologist. The special formula for glycerite of boro-glycerin is given, as well as a special method for preparing yellow mercuric oxide ointment by the wet process; the latter preparation being probably more frequently used in ophthalmic practice than any other.

A number of practical ophthalmic medicinal agents are recorded in alphabetical order. Considerable space is also devoted to a consideration of special apparatus.—Am. J. Pharm., 89 (1917), 296. (I. G.)

Frost-Bite.—*Etiology of.*—According to Raymond and Parisot, frost-bites, especially those of the feet, must be attributed to a specific infection, because under the toe-nails numerous onychomycoses can be found. The authors prepared cultures on gelatin and found in addition to *Penicillium glaucum* and other bacteria, a bacterium which they named *Scopulariopsis koningii oudemans*. In addition to this bacterium, *Sterigmatocystis* bacterium and other bacteria of the *Scopulariopsis* variety were found. These bacteria are present in hay and in manure, and are frequently found also in mud, from which they get under the toe-nails when torn shoes are worn. Frost-bites are therefore best treated with antiseptics. Soap containing borax and camphor has been used with advantage. In the war, in order to reduce the number of cases of frozen feet, it is absolutely necessary to keep the trenches dry and to pay special attention to cleanliness of the clothes and skin.—*Compt. rend.*; through *Drug. Circ.*, 61 (1917), 14.

Mouth Washes.—*In Health and in Disease.*—Dr. Helen Pixel Goodrich states that the ideal to be aimed at in oral hygiene is the prevention of the growth of leptothrix altogether, there being reason to believe that it is the cause of pyorrhœa. The author performed a series of experiments to test the action of certain liquids on the common organisms of the mouth, and these proved that a saturated aqueous solution of thymol is a very good antiseptic for ordinary mouth bacteria, and is the best the author has been able to find. It has a pleasant taste, causing a temporary burning sensation, and stimulating a flow of saliva. For ordinary use a saturated solution may easily be prepared by placing a crystal of thymol into a bottle of cold or warm water and shaking the bottle occasionally, when the solution becomes saturated after some hours. Boric acid gave disappointing results. As an ordinary germicide, emetine hydrochloride was also unsatisfactory, and harmine hydrochloride, which was tested for its action on ameba, had much the same germicidal value as emetine. Even in such weak solutions as 1 in 3,000 iodine proved to be a splendid antiseptic, but it is contraindicated as an ordinary mouthwash because of its destructive action on the tissues. Hypochlorite solutions, even if they do not attack the teeth, as is generally maintained, are unsuitable for ordinary use, owing to their instability. Oxidizing agents, such as hydrogen dioxide, are too readily reduced to be successful in the

hands of an ordinary patient, and potassium permanganate is only a weak antiseptic, and, in addition to staining the teeth, has a harsh metallic taste. Zinc sulphocarbolate is almost inactive, and flavine and other dyes must be excluded on account of their tinctorial properties. An antiseptic solution is much to be preferred to a paste or a powder—and in health, as well as in cases of oral disease, antiseptic mouth-washes should be used as often as possible, and a really satisfactory mouth-wash, both cheap and effective, is a saturated aqueous solution of thymol.—Brit. Med. J.; through Pharm. J., 98 (1917), 344.

Pediculosis.—*Prevention of.*—Experience has shown that simple cleanliness, however scrupulous is under certain conditions inadequate to prevent invasion by pediculi, and Capt. Gunn was forced to the conclusion that an anti-parasitic prophylactic was necessary, and, according to all testimony up to the present, this seems to have been found in the following treatment: Undergarments, such as undervests, made of butter-muslin, shirts, etc., are dipped in one per cent. solution of naphthalene and sulphur in benzol or gasoline. The hydrocarbons evaporate in a few minutes and the fabric is impregnated with the medicating agents in a state of very fine division, and retains them sufficiently long for practical purposes, while the garments so treated, when worn next the skin, did not cause any irritation. The author is of opinion that the disrepute into which sulphur has fallen as a preventive or destroyer of pediculi is probably due to the use of sulphur ointment, in which the sulphur is not likely to be changed into sulphide, whereas this compound will be more readily formed from the finely divided sulphur in the textile fabric, and the resulting partly enclosed vapor may reach a concentration sufficiently high to be injurious to the pediculi. In any case the presence of the sulphur may have the effect of preventing the generalized spread of scabies which has been prevalent at home and abroad, and there is some evidence in support of this view. It is possible that this procedure might find its uses in civil practice, since it is at once a method of prevention and treatment. An example of this is afforded by the application of the medicated vests in patients underneath plaster jackets. In all cases in which these vests have been used so far there has been freedom from pediculosis and skin irritation.—Brit. Med. J.; through Pharm. J., 98 (1917), 410.

Pharmacologic Equivalents.—*Prescribing by.*—Dr. Y. Delarge proposes a method for prescribing, which is devised to relegate the whole of the responsibility of correct dosage to the pharmacist. It is suggested that the prescriber should not trouble about the doses of the drugs to be given. When prescribing, he should merely indicate a certain number of appropriate doses, leaving the amount to be given in each case entirely to the compounder. It is argued that the former has no time to learn and remember doses; whereas the latter has always his books at hand to which he can refer. To carry out this scheme, the agreed normal dose for twenty-four hours either in weight or volume, for an adult, of any preparation, is designated the “pharmacological equivalent,” and represented by the letters E. P. One-tenth part of this is to be known as the “therapeutic unit,” and represented by the figures U. T. Under this scheme a prescription would be written thus: Pyramidon, 5 U. T.; phenacetin, 3 U. T.; exalgin, 2 U. T. For 5 cachets to be taken in twenty-four hours. Twenty-five such to be sent. When excipients and liquid vehicles are prescribed, these are to be left entirely to the pharmacist, thus: Potassium bromide, sodium bromide, ammonium bromide, of each 4 U. T.; distilled water, syrup of orange of each q. s. Three tablespoonfuls a day.—*L'Union pharm.*; through *Pharm. J.*, 98 (1917), 405.

Phosphatids.—*Specificity of Drugs for.*—MacArthur and Caldwell attempt to see if there was any evidence that brain lecithin was involved in the specific action of brain drugs and whether heart drugs were related to heart lecithin. Their experimental work was carried out by precipitating lecithin solutions with calcium chloride solution as controls and by precipitating the same lecithin solutions with calcium chloride after the addition of the alkaloid or other medicine whose effect was being studied.

Their conclusions were:

1. Drugs do not affect the auto-intoxication of lecithin.
2. Heart drugs do combine with heart lecithin, but with no direct specificity, since they affect brain lecithin the same way.
3. With alkaloids the precipitation limits of calcium chloride on lecithin solutions are different, when different salts are used. Hence, in comparative study, free alkaloids should be used.
4. The higher the drug concentration, the greater the amount of combination with the lecithin.—*Am. J. Pharm.*, 89 (1917), 435.

Physiology and the War.—In the course of a lecture under this heading C. S. Sherrington touched upon various interesting subjects. He showed that in a 10-hour day in a munition factory, the last hour of the 5-hour period, just before the midday meal and before leaving off at night, showed an access of work. When the hours were reduced from 66 to 56 per week, the output advanced from 6,150 to 6,759 articles. The product of the work of 200 women, turning aluminum fuse-bodies, working 10 hours a day, Sunday included, showed an increase when their working time was reduced 25 per cent. with no work on Sunday.

The speed of response of the simple reflex movement known as knee-jerk was reduced 9.6 per cent. and the amplitude of movement by 48 per cent., after the subjects had received, unknown to themselves, a dose of absolute alcohol equivalent to $2\frac{1}{2}$ ounces of whiskey. The speed of finger movements was lessened by 8.9 per cent., and in protective closure of the eyelid, the speed was impaired by 6 per cent. and the protective movement by 26 per cent. These results were not due to a general sedative action, as the pulse rate was increased in every instance.

In speaking of tetanus toxin he said that in September, 1914, the wounded men in the European war showed 1.6 per cent. case of tetanus, and in October 3.2 per cent. The use of an immunizing serum upon all wounded men since this date lowered this record to less than 0.2 per cent. in November and to zero in January, 1915, and since then it has fluctuated between 0.1 and 0.5 per cent.—Chem. and Drug., 89 (1917), 154. (K. S. B.)

Pyorrhea.—*Cause.*—J. T. Hall says that although the primary cause of pyorrhea is dietetic, the use of strong (especially carbolic) dentifrices is an important contributory factor.—Chem. and Drug., 89, (1917), 769. (K. S. B.)

Rheumatism.—*Intravenous Injections of Foreign Protein for.*—H. B. Thomas reports on the treatment of chronic rheumatism by means of intravenous injection of foreign protein at Cook County (Illinois) Hospital. As a result of extended trial, Thomas believes that in subacute and chronic cases of osteoarthritis one will make no mistake to administer typhoid vaccine intravenously. He cautions against the treatment of acute cases by this method, and emphasizes the need of a careful preparation of the patient and a small initial dose of the typhoid vaccine. The injection is fol-

lowed by a chill, and then a disappearance of pain and joint symptoms in most cases. Many recurrences take place, however.—J. Am. Med. Assoc., 69 (1917), 770. (W. A. P.)

Serobiologic Reactions.—*Five Years' Observations of.*—Dr. Charles R. Ball discusses fully the various facts involved. He stated that the serobiologic reactions should be regarded in the same manner as the symptoms in a clinical picture. They furnish only a part of the information, which must be carefully weighed in connection with all of the other facts obtained. Often when other symptoms fail, they are found to be present, and give the clue to the proper diagnosis. In typical cases, hard and fast rules cannot be formulated for these reactions any more than for the other symptoms.—J. Am. Med. Assoc., 68 (1917), 262. (W. A. P.)

Simulation of Disease.—In an issue of "Public Health Reports," A. G. Dumez describes various diseases feigned by malingerers, the means by which the deception was attempted and the methods employed by Army physicians and pharmacists for the detection of such tricks. The article should be read in full.—Pharm. Era, 50 (1917), 167.

Teeth.—*A Cause of Decay of.*—R. Niedergesass states that apparently healthy teeth of both adult men and animals have defects in the enamel through which solutions can penetrate into the interior. This may be demonstrated by suspending the crowns of freshly extracted teeth in aqueous solutions of fuchsin or of silver nitrate. Fetal teeth of the calf show the same defects. It is evident therefore how decay-producing agents can enter teeth. The author has isolated a streptococcus from decayed teeth, which has the property of forming large quantities of free acid and of decomposing calcium carbonate. Other bacteria isolated from the same source had not this property, nor did they increase the activity of the streptococcus when grown in a mixed culture. These streptococci are only slightly pathogenic.—Arch. Hygien.; through Pharm. J., 98 (1917), 87.

Therapeutic Evidence.—*Crucial Test of.*—At the New York meeting of the American Medical Association, T. Sollmann dis-

cusses the difficult question of the relative value of laboratory and clinical evidence as to the use of a medicine. He expresses the opinion that the only way to secure reliable clinical data is to submit to the physician as "unknowns," a sample of the preparation under investigation and a sample of an inactive preparation with a request that the observer aim to distinguish between the two preparations from their effects on the patient.—*Am. J. Pharm.*, 89 (1917), 392.

DRUG STANDARDIZATION.

Biologic Assays.—W. Storm van Leeuwen points out that by estimating chemically only the chief active principle of a drug or medicinal preparation these products cannot be well valued as to their therapeutic activity, since other constituents in them very probably act synergistically, increasing or decreasing the potency of this principle. With some drugs, like digitalis, etc., it is impossible to determine the active principle and in such cases biologic experiments have to be applied. The author gives a detailed account of the biologic assay methods adopted by the U. S. P. IX, and of other well-known processes.—*Pharm. Weekblad*, 54 (1917), 391. (H. E.)

Biologic Assays.—*Methods of U. S. P. IX.*—P. S. Pittenger subdivides the history of standardization into five steps, the fifth, which marked an epoch, being the introduction, into the U. S. P. IX, of a chapter on "Biologic Assays."

He thinks the methods of the Pharmacopœia lack needed details and are not as accurate as those commonly used in some commercial laboratories. He takes up in turn the "points of weakness" in the methods for cannabis, aconite, digitalis, strophanthus, squill, suprarenal gland and pituitary extracts. Valuable suggestions about overcoming the faulty directions are given but the paper in its entirety must be read to carry them out, accuracy of detail not being possible in a brief abstract.

Mr. Pittenger believes that the next revision committee, besides having definite requirements for the test substance itself, should secure an accurate co-ordination of the required U. S. P. strength and the common pharmaceutical practice.—*J. Am. Pharm. Assoc.*, 6 (1917), 865. (Z. M. C.)

Biological Standardization.—Under this heading Herbert C. Hamilton enters various objections to the methods of biological assaying outlined in the U. S. P. IX. His objections are summarized as follows: Under the heart tonics the method is declared inaccurate because the end-point is obscured by variable rate of absorption and the shock in exposing the heart. The standard, ouabain is objected to because it is not from the official drug and is not uniform in composition or activity. Under *cannabis sativa*, Hamilton holds the wording of the text to be inaccurate and objects to the smallness of the test dose, the absence of a uniform standard, and to the complications of the method with no commensurate gains in the activity or uniformity of the product.

Under suprarenal gland, the inaccurate manner of measuring the test dose, the incomplete administration of the test dose, and the method of making the check assay are objected to. Under pituitary gland it is claimed that the standard which is not adapted to measuring blood pressure activity is not a practicable oxytocic agent in therapeutics and is not derived from the pituitary gland. The activity of the standard product and the inaccurate and unsatisfactory character of the method of assay are further objections voiced by the author.—*Am. J. Pharm.*, 89 (1917), 61. (R. P. F.)

Drug Assays.—A further contribution to the standardization of drug assays has been made by Hebeisen, with the following results:—*Cinchona bark*.—It is absolutely necessary to convert the alkaloids present into the hydrochlorides or sulphates. The Swiss Pharmacopœia is the only one that requires this to be done. The Belgian, German, Hungarian, Japanese, Dutch, and Swedish Pharmacopœias liberate the alkaloids with an alkali, and of these the Dutch Pharmacopœia is the only one that gives good results, all the others being too low. The method of the Swiss Pharmacopœia is the best. *Extract of Cinchona*.—Here again the Swiss method is the best. The Belgian gives good results, but uses too much material. *Fluidextract and Tincture of Cinchona*.—Here again the Swiss method is found to be the best. *Areca Nuts*.—The Swiss method, using iodeosin instead of hematoxylin, gives quick and accurate results, but the minimum required by the Pharmacopœia (0.5 per cent.) is decidedly too high. *Anthraquinone Drugs*.—Tschirch's and Warin's colorimetric determinations are the best. The assay may be carried out as follows, without any expensive

colorimeter: Boil 0.5 Gm. of the finely powdered drug with 50 mls of 5 per cent. sulphuric acid for 15 minutes in a flask provided with a reflux condenser. Cool and shake the liquid (without filtering) with successive portions of 50 mls of ether until the latter is colorless and does not color dilute solution of potash. Free the aqueous solution from ether and repeat the boiling and shaking out. Unite the ethereal solutions and shake with 200 mls of 5 per cent. solution of potash until the latter is no longer colored. Mix the alkaline solutions, make up to 500 mls and dilute 100 mls of the mixture to 1 liter. 350 mls of this diluted solution made up to 1 liter should appear distinctly cherry-red when viewed in a liter flask standing on white paper and possess the same depth of color as an alkaline aloë-emodin solution 1 in 1,000,000. For aloë the method must be modified as follows: Dissolve 1 Gm. of aloë in 50 mls of 30 per cent. spirit, shake out with benzene until the oxymethylantraquinone reaction disappears; then shake the benzene solution with 100, 50 and 50 mls of solution of ammonia; dilute the ammoniacal solutions to 1 liter and compare with the normal solution. (The author's results appear to require efficient confirmation, for which purpose the original must be consulted.)—Schweiz. Apoth. Ztg.; through Pharm. J., 99 (1917), 111.

Spices.—*Standardization of.*—A series of definitions and standards for spices has been drawn up by a committee of the United States Department of Agriculture, and these definitions and standards are now under official consideration. Spices are generally defined as aromatic vegetable substances used for seasoning food, and from which no portion of any volatile oil or other flavoring principle has been removed, and which are clean, sound, and true to name. Cardamom seed should contain not more than 8 per cent. of total ash; nutmeg should contain not less than 25 per cent. of non-volatile ether extract, not more than 5 per cent. of total ash, not more than 0.5 per cent. of ash insoluble in hydrochloric acid, and not more than 10 per cent. of crude fiber. Ground cinnamon should contain not more than 5 per cent. of total ash and not more than 1 per cent. of ash insoluble in hydrochloric acid.—Pharm. J., 98 (1917), 346.

PERFUMERY MATERIAL.

Perfumery.—*History and Manufacture.*—F. K. Woodward speaks of perfumery as being as old as civilization itself. He discusses

the origin of perfume in flowers and outlines the extraction of odors therefrom. The article has an illustration of rose oil stills and one showing the packing of jasmine flowers in trays prior to enfleurage.—*Pract. Drug.*, June, 1917, 28.

Perfumes.—*Source, Preparation and Uses.*—F. F. Ingram, Jr., gave an address on this subject to the students of the College of Pharmacy of Iowa University. He described enfleurage, concrete manufacture and the development of the synthetic perfume industry. He then discussed perfume salesmanship, pointing out the different uses of toilet waters and handkerchief extracts and suggesting how the sales of both may be stimulated.—*Pharm. Era*, 50 (1917), 149.

MISCELLANEOUS.

Adulterated Imported Drugs.—The U. S. Department of Agriculture announces action against imports of adulterated drugs. *Belladonna* root was adulterated with yellow dock; *cantharides* was adulterated with so-called Chinese blister flies, and *cinchona* bark offered for entry was deficient in alkaloid. Other drugs were illegally labeled.—*J. Am. Med. Assoc.*, 69 (1917), 1792. (W. A. P.)

Adulterated Drugs.—O. Tunmann reports on the following adulterated drugs: *Belladonna* is frequently not only adulterated with the leaves of *phytolacca* and *ailanthus* but also with *Plantago media*. *Levant Wormseed.*—The santonin-free drug comes from Southern Russia and can easily be distinguished from the genuine drug by the phloroglucinol-hydrochloric acid reaction originated by the author. The powdered drug is also adulterated with *gramineæ*, chamomile flowers and tansy flowers. The latter can easily be distinguished from *Levant wormseed* by the starch grains which are spiny in the case of tansy and smooth in the case of wormseed. *Gentian.*—A sample of the powdered drug consisted of the powdered needles of *Picea excelsa*.—*Apoth. Zeit.*; through *Pharm. Weekblad*, 54 (1917), 1427. (H. E.)

Iron in Agriculture.—A. Monnier and L. Kuczyaski, publish some interesting facts concerning the use of iron in agriculture. The authors found that if a dilute solution of a ferric salt was applied to the soil at the beginning of vegetation, that plant growth

was favorably influenced, but that if applied at a later stage, no such effect was noticeable. It has been shown that the iron present in soils of ordinary composition is assimilated only with difficulty by the plant, being practically insoluble in water and in dilute alkali solutions. Solutions of some organic acids, in diluted form, would, however, seem to render such iron more soluble, as for example, a 1 per cent. solution of citric acid. Certain varieties of silicious soils, devoid entirely of lime, are found to contain water-soluble iron in considerable amount. In such soils hydrangeas which in ordinary soils exhibit a pink flower, produced a blue one. If, however, a certain amount of magnesia or calcium carbonate is mixed with such soils, the iron is rendered insoluble and the plants produce pink flowers. It is shown that when dilute solutions of iron salts are allowed to percolate through soils of ordinary composition, that the iron is entirely precipitated as carbon or hydroxide and is retained in the superficial layers of the earth. In soils containing 5 per cent. of lime the penetration does not exceed 2 Cm. For this reason treatment with iron solutions has no effect on plants whose roots have penetrated for a greater distance in to the earth. It is also reported that potassium ferrocyanide if applied to soils in such manner, is not precipitated, but a part of it is oxidized into ferricyanide and a part of the potassium is retained by the earth.—Arch. Sci. phys. et nat.; through C. U. C. P. Al. J., 24 (1917), 176. (G. C. D.)

Phytochemical Research.—Frederick B. Power, in an interesting address before the Washington Chemical Society, points out the importance of the chemical examination of plants and states that phytochemistry, in its broadest sense, may be considered to comprise the application of chemical science to all conditions affecting the cultivation and growth of plants, as well as a knowledge of their constituents.

He also discusses the chemical characteristics, etc., of chaulmoogra oil and the plant from which it is derived, as well as other plants which have been studied from a phytochemical viewpoint.

The services of the Phytochemical Laboratory of the Bureau of Chemistry of the Department of Agriculture are offered in promoting the knowledge of plant constituents and the application of such knowledge.—Am. J. Pharm., 89 (1917), 97. (R. P. F.)

Phytochemical Studies in Caucasus.—M. N. Kozlov studying eucalyptus species found that the amount of oil is greatest in the spring and early summer. Drying of the leaves yielded smaller quantities of condensation water, hence required less fuel for distillation. Desiccation caused no loss of essential oil. From the chemical standpoint *E. globulus*, *E. maideni* and *E. pulverulenta* may be classed together, as they yield very similar oils, containing over 40 per cent. eucalyptol. The probable expenses and receipts of the production and commercial extraction of essential oils are: capital for laying out plantations, £19 per acre; annual expenditure about £8 per acre; a return of £19 4s. to £22 8s. per acre may be expected, representing interest at the rate of 13 to 30 per cent. on a capital of £2600 to £3200, laid out on 25 to 50 acres of land and on the building of the factory. Investigations were made on the wild mint (*Mentha pulegium*) and castor oil. The yield of oil from fresh mint was 0.4 per cent. and after drying in the air 1.09 per cent. In castor oil seeds the proportion of oil reached 49.5 per cent. By using fresh leaves of a tree of *Cinnamomum camphora* (about 20 years old), 0.9 per cent. of raw camphor was obtained; 22.6 per cent. of the total quantity consisted of camphor oil, the remaining 77.4 per cent. being camphor. Experiments with large branches gave negative results; no separation of solid camphor took place, but a small quantity (0.09 per cent.) was obtained of an oleaginous substance with a peculiar smell which recalled that of camphor.—Bull. Agr. Intelligence; through Chem. Abstracts, 11 (1917), 3094.

B—VEGETABLE DRUGS.

Acacia.—*Intravenous Injection of Solutions in Hemorrhage.*—S. H. Hurwitz finds a five per cent. solution of gum acacia in Locke's solution preferable to the other colloidal injections, such as gelatin solutions, for restoring the blood pressure after severe hemorrhage. Acacia is considered to be preferable for this purpose to substances containing protein, or rich in carbohydrates. Also its solutions are more easily sterilized. The solution should be administered as soon as possible, introduced at a moderate, and not in too large quantity. The 5 per cent. solution above indicated has a viscosity of 2.2, approximating closely to that of the blood plasma, which is from 1.7 to 2.0.—J. Am. Med. Assoc., 68 (1917), 699.

Acer Spicatum.—*Color Reaction of the Extract.*—In a contribution from the laboratory of the American Medical Association, B. H. St. John calls attention to the fact that *Acer spicatum* contains a substance which gives a crimson color with ammonia, and which may be similar to the emodins of the common cathartic drugs. It also contains a substance which gives a blue color with ferrous sulphate, which is similar to that obtained with rhubarb. While the identification of *Acer spicatum* in the presence of rhubarb cannot be accomplished by these tests, they are, nevertheless, of value for the identification of the extract of *Acer spicatum* in many medicinal preparations.—*Am. J. Pharm.*, 89 (1917), 10. (R. P. F.)

Aconite.—*Adulteration with Aconitum Fisheri.*—The officials of the U. S. Department of Agriculture in their Service and Regulatory Announcements, state that official aconite is frequently replaced in commerce with the so-called Japanese aconite, *Aconitum fisheri*, which contains other alkaloids instead of aconitine. Such aconites can only be sold in this country, when so labelled as to indicate geographic and botanic source, as well as the words: "Not recognized in the U. S. P."

Japanese aconite can be distinguished from the official drug by the smaller size and weight of its tubers, by their less wrinkled and untwisted appearance, by their short conical shape, by their more mealy appearance and by their vibrovascular bundles, which are not so markedly star-shaped as are the bundles found in official aconite.—*Am. J. Pharm.*, 89 (1917), 547.

Aconites.—*Pharmacology of.*—T. R. Fraser states that of the 150 known species of *Aconitum* only two or three have been examined pharmacologically. Although all those examined produce the same characteristic effects on the nervous system, secretions, circulation, and respiration, yet they may be divided into two classes. One of these acts predominately on the circulation, the other on the respiration. Those containing aconitine belong to the first class, those which yield pseudo-aconitine to the second category. *Aconitum napellus* is the most efficient of the aconitine class. *Aconitum heterophylloides* and *A. nigrum* belong to the pseudo-aconitine group.—*J. Pharmacol.*; through *Pharm. J.*, 98 (1917), 209.

Agar.—*Sources of Formosan.*—Y. Takao states that the following algæ are exported from Formosa for the preparation of agar-agar: *Gelidium amansii*, *G. japonicum*, *G. pacificum*, *G. subcostatum*, and *Pterocladia capillaceum*. *Gelidium amansii* yields the best agar-agar. The others give a product of lower quality, and may be looked upon as adulterants. *Pterocladia* is specially poor in mucilaginous constituents. The mucilages of *G. amansii*, *G. pacificum*, and *G. subcostatum* give a violet color with iodine solution; the mucilages of the other seaweeds named do not give this reaction. All afford galactose with small quantities of fructose and arabinose, on hydrolysis. They give mucic acid on oxidation but no saccharic acid.—J. Pharm. Soc. Japan; through J. pharm. chim., 15 (1917), 175.

Agar.—*Japanese Production.*—The Japanese output of agar for 1917 is not expected to exceed 2,700,000 kin, as compared to 3,300,000 kin in 1916, a decrease of 18 per cent.—Chem. and Drug., (1917), 311. (K. S. B.)

Agar.—*Use in Wound Treatment.*—Drs. Loeper and Barbarin have brought out a new treatment which has some advantage, especially in keeping the edges of the wound open, and in ease of working. They use small sachets of gauze of various shapes and sizes containing agar, in the form of flakes. Being of a mucilaginous nature, it swells up in water, absorbing about 8 times its weight. Being an elastic substance which can be diluted or compressed and which retains liquids, it possesses the qualities which are lacking in those substances usually employed in wound treatment. Agar is also a good absorbent for antiseptics. The bags containing the flakes are best sterilized by dry heat. The authors have applied this method to a great many wounds with excellent results.—Sci. Am. Suppl. No. 2158, May 12, 1917, 294. (O. R.)

Agar.—*Administration of.*—O. H. Brown and W. O. Sweek favor the administration of agar in the form of hot lemonade, chocolate or bouillon. For the preparation of a lemonade they direct to take 2 heaping tablespoonfuls of the agar powder, flakes or shreds; add to 1 quart of water, and boil till the agar is thoroughly liquefied; sweeten and add juice of one lemon, then drink the entire quart while hot. They suggest that the quart of hot agar lemonade may be prepared in the morning, poured into a vacuum bottle, and taken leisurely during the day. They find that some patients prefer

to make use of orange, grapefruit, vanilla, maple or other flavoring in place of the lemon.—J. Am. Med. Assoc., 69 (1917), 467. (W. A. P.)

Algæ.—*Form of Iodine in.*—Yokuda and Eto find that the greater part of the iodine in the algæ investigated was in organic combination. In *Ecklonia cava*, 90 per cent. of the total iodine was in the organic soluble form, and was not liberated by boiling with dilute sulphuric acid, nor with potassium hydroxide. Under five per cent. of the total iodine occurs as iodide. In this plant, the amount of iodine is greatest in the summer, and old plants contain more than young. In *Turbinaria fusiformis*, *Sargassum enerve*, and *S. horneri*, the amount of iodine in soluble organic combination was 50, 78, and 66 per cent., respectively, of the total amount present. The iodine is mainly combined with the protein; from this it is readily liberated by dilute solutions of sodium chloride, and hydrochloric acid. Since the iodine content of dead algæ is rapidly diffused into sea water, drift weed is not a suitable material for its preparation. Seaweeds from the open sea are richer in iodine than the same species growing in inland seas. Iodine is liberated from its organic combination on boiling the seaweed with dilute formaldehyde solution. This affords a simple and ready test for it in this condition.—J. Coll. Agr. Tokyo; through Pharm J., 98 (1917), 499.

Alpinia Nutans.—*Constituents of the Leaves of.*—K. Kafuka find that they contain 0.053 per cent. of volatile camphor-like odor having the following characteristics: sp. gr. 0.9301, n_D^{20} 1.4750, polarization (100 Mm.) $\alpha_D + 38.4^\circ$, saponification value 9.88, same after acetylation 36.1. Kafuka detected in the oil *d*-camphane (isoborneol, m. p. 212–213°), *d*-camphor (oxime, m. p. 117–118°), cineole (iodole compound, m. p. 132.5–133°; benzaldehyde formation by 10 per cent. permanganate solution). Besides the presence of limonene, sesquiterpene, and a high boiling phenol is very probable. The essential constituents are camphor (more than 30 per cent.) and camphane (17 per cent.).—J. Chem. Ind. Tokyo; through Chem. Abstracts, 11 (1917), 2387.

Ambrosia Species.—Theodore Holm, continuing his monographs on the medical plants of North America discusses *Ambrosia artemisiæfolia* and *A. trifida*, the common weeds now known as a

source of hay fever. The article which covers 7 pages and which is illustrated with 30 drawings, should be read in full.—Merck's Rep., 26 (1917), 62, 120 and 179.

Annatto.—Brazil and French Guiana have always been the world's leading countries in the production and sale of annatto. The original West Indian name was "Urucu," which the French corrupted to "Roucou." Its local name in the tropics as "Achiote" or "Bija." The annatto plant is a small tree or shrub, about 12 feet high. The fruit is a prickly heart-shaped pod, about one inch long, consisting of two valves. The ripe pods open and furnish the small seeds which are covered with a soft vermilion-colored rind or pulp, which contains the coloring matter, which is removed by maceration and percolation. The 2 principal varieties on the market are the Cayenne in 2- or 3-pound square soft cakes, and the Brazilian in 2- or 3-ounce hard rolls.

The coloring properties of annatto were discovered by the early explorers from its use as a paint on the bodies of the Caribbean Indians. Besides its use as a dye for cotton and silk, it is extensively used as a stain for cheese, butter, milk, candies, soaps and varnishes. About one ounce will color about 100 pounds of cheese or butter, without producing any odor or taste. In Spain it is used to impart a beautiful tint to chocolate. It is supposed to act as a purgative internally, and also as an antidote against the poison in cassava.

Three years after planting the tree a crop of seeds may be expected. A full bearing tree will yield from 16 to 48 pounds of pods and from 2 to 6 pounds of seeds, which wholesale at about 17 cents per pound.—Sc. Am. Suppl., Nov. 17, 1917, 309. (O. R.)

Apios Fortunei.—*Constituents of the Root of.*—K. Iwamoto reports that a 3-year old child was poisoned by the root of *Apios fortunei*, a wild climbing plant which the inhabitants of Hokkaido use as a cough remedy. Iwamoto made a chemical examination of the roots and was able by the Stas-Otto method to isolate a crystalline substance which appears to be an alkaloid, and the active principle of the root. No properties nor analytical data are given.—J. Pharm. Soc. Japan; through Chem. Abstracts, 11 (1917), 3382.

Arnica.—*Adulteration of.*—The adulteration of arnica with *Inula britannica* has been discovered by examination of recent United States importations.—Chem. and Drug., 89 (1917), 557. (K. S. B.)

Asparagus Officinalis.—*Constituents of the Fruit.*—N. E. Hehner submitted asparagus berries to analysis and found in them 36.12 per cent. of sugars, 1.08 per cent. of fat having the saponification number 178; 1.56 per cent. of nitrogen as protein; and 3.5 per cent. of ash, consisting of the carbonates, silicates, sulphates and phosphates of aluminum, iron, calcium, magnesium, potassium and sodium.—Chem. News, 116 (1917), 296.

Avocado.—*New Sugar from.*—F. B. La Forge has obtained from avocado, the fruit of *Persea gratissima*, a dextrogyrate mannoketo heptose $\text{CH}_2\text{OH} - (\text{CHOH})_4 - \text{CO} - \text{CH}_2\text{OH}$, melting at 152° , having a rotation $\alpha_D = + 29^\circ 37$ and yielding a brom-phenylhydrazone melting at 179° . On reduction with sodium amalgam, it yielded the heptatomic alcohol, perseite, obtained in 1888 by Maquenne, from the avocado.—J. Biol. Chem.; through J. pharm. chim., 15 (1917), 263.

Banana.—*Nutritive Value of.*—According to Victor C. Myers and Anton R. Rose, nutritional studies on the banana indicate that, when thoroughly ripe, it is one of our most valuable fruits; having a higher caloric value than any other common fruits. When fully ripe, that is, when the starch has been almost completely changed to sugar (the experiments here reported show) the carbohydrates of the banana are well absorbed from the intestine; it would seem that gastro-intestinal disturbances when attributed to the banana were referable to unripeness. Much larger quantities of sugar (glucose, sucrose, levulose) may be given in the form of banana than as pure sugar (sucrose, glucose) without producing gastro-intestinal disturbances.—J. Am. Med. Assoc., 68 (1917), 1022. (W. A. P.)

Barley.—*Utilization of Nutritive Constituents.*—M. Busemann adduces evidence to show that 70 per cent. of the nutritive constituents of barley are utilized when this is used and consumed in the form of beer; and to this must be added the value of the spent brewers' grains and yeast as fodder. When barley is used directly for feed-

ing pigs or other stock, only about 10 per cent. of the nutritive constituents is eventually consumed by man, the remainder being destroyed within the animal. — *Zeitschr. ges. Brauw.*; through *Pharm. J.*, 98 (1917), 405.

Bay Rum.—*Production in Danish West Indies.*—Dr. N. L. Britton in a contribution to the *New York Times* states that the acquisition by the United States of the Danish West Indies will supplement the Porto Rican bay rum industry. The best bay trees are found on the island of St. John and spring up spontaneously from seed. No oil is distilled in St. Thomas, but this island and port is the receiving center for oil produced on the other islands.—*Am. Drug.*, 55 (1917), 36. (C. W. B.)

Bay Rum and Bay Oil are distilled from the West Indian *Pimenta acris*, but it is unfortunate that another tree of exactly similar outward appearance possesses leaves which yield a lemon-scented oil. As a fact, the true and false bay oil tree can only be distinguished by the scent of the oil, which may be extracted from their leaves. The reason that the islands of St. Thomas and St. John have long been noted for producing the best bay oil is probably that the "Lemoncillo," or false bay-oil tree, does not grow there.—*Bot. J.*; through *Pharm. J.*, 98 (1918), 489.

Belladonna.—*Breeding for Atropine.*—L. Wayne Army gives the results of some experiments in breeding belladonna plants for atropine at the Mulford Experimental Drug Gardens. He finds that little success attends the attempt to increase the amount of atropine in belladonna plants by hybridization. On the other hand, by careful selection of seed, the amount of atropine has been increased materially. Figures based on a breeding plot of 500 belladonna plants, chosen from a lot of several thousand seedlings, show that an average alkaloidal content of 0.507 per cent. was obtained, as compared to the standard 0.3 per cent. required by the *Pharmacopœia*. Nearly 70 per cent. of the plants were above standard, and 6 of them yielded 1 per cent. or more of alkaloid, the highest being 1.23 per cent.—*J. Heredity*; through *Am. J. Pharm.*, 89 (1917), 254. (R. P. F.)

Belladonna.—*Cultivation in California.*—Stating that most of his conclusions are based on the results obtained from field tests

carried out on a commercial scale, Albert Schneider gives an extended discussion of belladonna and its cultivation. He makes the following divisions of the subject and treats each division at some length: I. General Description of the Plant and its Botanical Relationships. II. Range and Distribution. III. Earlier Uses made of Belladonna. IV. Medicinal Uses and Therapeutic Values. V. Parts of the Plant which are Used Medicinally. VI. *Belladonnæ Folia*. VII. *Belladonnæ Radix*. VIII. *Belladonna Herba*. IX. *Belladonna Root*. X. Powdered Belladonna Herb. XI. Powdered Belladonna Root.—*Pacif. Pharm.*, 11 (1917), 161. (C. M. S.)

Belladonna.—*Indian Varieties.*—E. M. Holmes describes a form of Indian belladonna root appearing in English commerce as differing from ordinary belladonna in that the woody rays usually found only near the upper part of the root in belladonna, in the case of Indian belladonna occur also in the smaller pieces of root. The Indian root also presents a porous rather than starchy structure and on analysis yielded 0.7 per cent. of alkaloids as against 0.5 per cent. for the English root. He points out that the Indian root may come from one of several plants; mentioning, *Atropa belladonna*, var. *lutescens*, *Atropa acuminata*, *Scopola lurida* and *Physochlania præalta*. He particularly emphasizes the fact that mere alkaloidal content of solanaceous drugs is no criterion of therapeutic value; that the character of the alkaloids present should be determined before the drug is used in retail pharmacy, especially when it is to be used as a mydriatic.—*Pharm. J.*, 98 (1917), 351.

Belladonna Leaves.—*Adulteration with Solanum Nigrum.*—The officials of the Bureau of Chemistry, U. S. Department of Agriculture, state that many recent importations of "belladonna leaves" contain the leaves of *Solanum nigrum*. Such samples will hereafter be refused entry into this country.—*Am. J. Pharm.*, 89 (1917), 549.

Belladonna Seed.—*Germination of.*—A. F. Sievers, of the Bureau of Plant Industry, performed a series of experiments with the view of throwing some light on the question as to whether belladonna seed is best collected when the berries are ripe and fresh, or when they have dried on the plant. He found that if the ber-

ries were picked when ripe and succulent, and the seed was at once removed from the pulp by washing through a sieve, and then drying, the heaviest seed as well as a seed of most uniform color was produced. When the berries were allowed to dry spontaneously, much mold and partial decomposition resulted, and the seed was very poor in color. When the berries were allowed to remain on the plant until they were dry, the seed was lighter than in both previous cases, and showed a low percentage of germination. It was found that seeds from different individual plants differed considerably in vitality.—Am. J. Pharm., 89 (1917), 203. (R. P. F.)

Benzoin.—*Source of Siamese.*—H. Rordorf, who has already made valuable communications concerning the botanical source of Siam benzoin, now describes ripe fruits of the tree. These were sent to him direct from Siam, and are not identical with the fruits of either *Styrax benzoin*, Dryander, or *S. benzoides*, Craib. The illustration that most nearly agrees with them is that of *S. benzoin*, published by Holmes, but distinct differences are to be found. Rordorf therefore proposes the name *S. siamensis*, Rordorf, for the tree. The fruit is oval-spherical with a slightly oblique apex, 2.5 to 3.0 Cm. long and 2.0 to 2.5 Cm. in diameter, dark greyish brown in color, and has a readily detachable stalk. The epicarp contains resin-ducts filled with an orange-red resin. The mesocarp is hard and brittle, about 1 Mm. thick. The seed is ovoid, bright lemon-yellow in color and oily; it is provided with a cordate depression, whereas in Holmes' illustration above referred to it is pointed. It is hoped that one or more of the seeds may be induced to germinate, and the plant then definitely described.—Schweiz. Apoth. Ztg.; through Pharm. J., 99 (1917), 111.

Birch Wood.—*Nutritive Value of.*—G. Haberlandt finely chopped birch wood in a paper mill so that the cell membranes were destroyed and water removed from the cell contents. This disintegrated wood was fed to a sheep with wheat, gluten, starch, molasses, calcium carbonate, and salt. The coefficients of digestibility of the wood corresponded to that of good meadow hay. Micro-examination of the excreta showed that good results were obtained only if the wood was cut very fine. Similar results were obtained with a dog, and it is concluded that man is capable of digesting finely ground birch wood.—Fortstwissenschaft Zentr.; through Pharm. J., 99 (1917), 88.

Bistort Root.—*Use as an Astringent Tonic.*—H. LeClerc directs attention to a valuable but much neglected indigenous plant, *Polygonum bistorta*, from the rhizomes of which the author has for long prepared a useful astringent tonic wine, according to the following formula: Crushed bistort root, 1; alcohol, 45 per cent., 2; macerate for 24 hours, then add claret sufficient to produce 8. Macerate for four days, then strain. This wine is prescribed in doses of $1\frac{1}{2}$ to $4\frac{1}{2}$ fluidounces in the course of a day. It has proved specially valuable as a tonic for tuberculosis patients, and for cases of debility with a tendency towards tuberculosis. According to many authorities, the treatment of such cases with tannin-containing drugs gives most satisfactory results. This is confirmed by the author, who finds that bistort root is at least equal, if not superior, to rhatany, and other exotic drugs, which have been much prescribed for this purpose.—*L'Union pharm.*; through *Pharm. J.*, 98 (1917), 275.

Broom Top.—*Use as Insecticide.*—With an aqueous extract of common broom, excellent results have been obtained in removing parasites from vines, cabbages and other plants. The coarsely powdered drug is macerated for ten days with water, and the aqueous solution, which exhibits a green color with a metallic luster and an oily appearance, is applied to the plants. Up to the present time it has not been established whether the tannic acid or the oil or the alkaloid sparteine exert the insecticidal power.—*Rev. Viticulture*; through *Drug. Circ.*, 61 (1917), 134.

Buchu.—*Substitutes for.*—Some samples of buchu offered to the American trade have been found by the officials of the U. S. Department of Agriculture to be non-pharmacopœial. The so-called "long buchu" consisted of the leaves of *Empleurum serrulatum*; that sold as "short buchu," was identified as *Barosma pulchellum*; while "oval buchu" proved to be *Barosma crenulata*, var. *latifolia*. The flavor of the first two adulterants is distinctly different from official buchu.—*Am. J. Pharm.*, 89 (1917), 549.

Cacao.—*Theobromine Assay of.*—L. Debourdeaux criticizes the Fromme method of theobromine assay and favors the Maupy method. He suggests, however, the following modified process:

Triturate 100 grammes of cacao with 4 mls of distilled water, then transfer to a liter flask and mix with 60 grammes of crystallized

phenol and 340 grammes of chloroform. Heat the mixture under a reflux condenser, during two hours, then filter, return the residue on the filter to the liter flask and boil during an hour with a second 300 mls of chloroform and with 50 grammes of a 15 per cent. phenol solution in chloroform. Filter and repeat the chloroform extraction a second time. The mixed chloroformic extracts are then distilled; the residue is treated with 900 grammes of ether, in which the phenol dissolves leaving the theobromine behind. The theobromine residue is then transferred to a filter, where it is washed completely free from phenol, caffeine, etc., with ether, after which it is dissolved in a mixture of 20 grammes of sulphuric acid (66° B) and 180 grammes of water, and more acidulated water is used to wash filter paper and flask. The acid solution of theobromine is then made alkaline by addition of 250 mls of ammonia (22° B), and to this ammoniacal solution, 3 grammes of silver nitrate are added. The solution is evaporated until free from ammonia odor and until it measures about 500 mls. It is then allowed to stand over night, after which the theobromine silver precipitate is collected, washed and mixed with water, treated with hydrogen sulphide, the free theobromine dissolved in boiling amyl alcohol, the boiling solution is filtered and then allowed to cool, when the theobromine crystals separate. These are collected on a filter, washed with ether, dried and weighed. For details concerning this lengthy process, the original paper should be consulted.—J. pharm. chem., 15 (1917), 306.

Cacao Shells are suggested as a substitute for tea.—Chem. and Drug., 89 (1917), 1109. (K. S. B.)

Caltha Palustris.—*Active Principle of.*—R. Kobert calls attention to an investigation of one of his pupils, Grote, in regard to the constituents of *Caltha palustris*, or marsh marigold. Grote found that poisoning by *Caltha palustris* is due to anemonin and not to cholin as claimed by several investigators. Kobert further reports that marsh marigold which has grown in moist soil or in swamps contains much more anemonin than a plant grown in a dry soil. In regard to the claim by P. A. Keegan (Chem. News, 1916, 25) that caltha contains in addition to carotin, isorhamnetin, quercitin, coffee-tannic acid, saccharose, pentosans, etc., the alkaloid veratrine and an amorphous resinous glucoside probably

helleborin. Kobert believes that this claim cannot be sustained because the plant does not produce the characteristic veratrine poisoning. He also could not isolate a glucosidal substance resembling helleborine.—Chem. Zeit.; through Pharm. Weekblad, 54 (1917), 1053. (H. E.)

Camphor.—*Factors Causing a Variation in Yield from Florida Trees.*—S. C. Hood, after distillation experiments on a small scale of the leaves and twigs of Florida grown camphor trees came to the following conclusions:

The maximum yield of camphor is obtained from leaves and twigs of the last year's growth, taken during the dormant season immediately following. Twigs which have remained on the tree for a second growing season suffer loss in camphor content.

Clipping of leaves and twigs increases the yield of camphor in the next growth, but severe trimming, which induces water sprouts, causes a low yield of camphor.

Even slight shade reduces the leaf area and decreases the yield of camphor, while a considerable yearly variation is caused by changing climatic conditions and rainfall.

Finally it is shown that the yield of camphor is proportional to the rate of growth, and that forcing the trees has a beneficial effect on the yield.—J. Ind. Eng. Chem., 9 (1917), 552. (G. D. B.)

Canaigre.—*Cultivation in France.*—A Piédallu reports that the plant *Rumex hymenosepalum*, which is indigenous to the South-Western United States, grows well in France. As it is an important source of tannin, largely employed in the tanning industry, its cultivation would probably prove remunerative. It grows from tubers, similar to those of the dahlia. The herbaceous parts die down in the autumn, to grow again in the spring. It can, therefore, resist the cold of French winters. Compt. rend.; through Pharm. J., 98 (1917), 109.

Cannabis.—*Criticism of U. S. P. Standard.*—W. A. Pearson says the present standard for cannabis is erroneous. The fact that fluidextract of any cannabis is "standard" if it has been "carefully prepared and suitably preserved" leads to the use of different standards by different manufacturers. Also, there is a very marked difference in the susceptibility of dogs to cannabis. In an earlier paper (See Year Book, 1916, 186), Mr. Pearson had suggested the

preparation of a "composite standard fluidextract" by the committee on physiological testing of the American Pharmaceutical Association. Each member furnished a quart and they were mixed. After three days the fluidextracts were filtered and put into four-ounce amber bottles, and two sent to each member of the committee with the hope that the manufacturers represented will use the sample as a standard. It is hoped also that this "composite standard" will be used generally in testing preparations of cannabis. Since the fluidextract is believed to keep if tightly stoppered, the bottles will be stored at room temperature, and the supply is ample for any who desire it.—J. Am. Pharm. Assoc., 6 (1917), 876. (Z. M. C.)

Cannabis.—*Resolution Anent Standard for.*—W. S. Hubbard and A. B. Lyons present a resolution which urges a modification of the official test and a change, from obligatory to optional, of the biological assay for cannabis. The reasons for these proposed changes are that the standard of the U. S. P. IX is illogical and indefinite. Further, this standard is mandatory while more important assays of greater merit are only optional. It excludes from the American market Indian cannabis in all probability equal in activity to that which has been imported heretofore. Detailed explanations of these reasons show "why the change is imperative" and why it concerns *all* pharmacists.—J. Am. Pharm. Assoc., 6 (1917), 877. (Z. M. C.)

Indian Cannabis.—*Deterioration of Crude.*—Marshall and others having shown that the deterioration in crude Indian cannabis is due to oxidation of the active principles, C. R. Eckler and F. A. Miller undertook a series of experiments to determine the rate of deterioration. "One lot of drug was stored in a cool basement: one portion sealed in alcohol, one portion sealed dry and one portion unsealed dry. Another lot was stored in a warm attic in four portions: one portion, granulated, sealed; one portion, granulated, unsealed; one portion, whole, sealed; one portion, whole unsealed."

Fluidextracts were made according to the U. S. P. except that no heat was used and these were tested on pure bred fox terriers. The results showed practically 100 per cent. loss in activity in 50 months in the samples stored in the attic. The average loss was 2 per cent. a month but the deterioration during the first 14 months was very little. The dry samples from the basement lost 60 per cent.

of their original activity in 60 months, an average of 1 per cent. a month, this lower figure indicating that heat hastened deterioration. No appreciable difference appeared between whole and granulated drug. The sealed sample, kept moist with alcohol, seemed to retain full activity for at least 60 months.—J. Am. Pharm. Assoc., 6 (1917), 872. (Z. M. C.)

Castor Oil Plant.—*Cultivation in Colombia.*—C. E. Guyant states that the cultivation of the castor bean in Colombia is beginning to assume considerable proportions. Started in a small way a few years ago by a retail druggist, it has grown so that now 350 acres are in cultivation in the Department of the Atlantic, and 1500 acres in the Department of Santander. The seeds are planted 2 meters apart in sandy, in well watered soil and the plant matures in $3\frac{1}{2}$ to 4 months. The harvesting is done by children who are sent out daily to gather the ripe pods, which are dried in the sun and are broken by hand after becoming brittle. The larger growers are now endeavoring to obtain thrashing machines that are made in England, for use in India.—Pharm. Era, 50 (1917), 374.

Catha Edulis.—Charles Moser, former American consul at Aden, presents an illustrated article "The Flower of Paradise," the part which Khat plays in the life of the Yemin Arab. When the European is weary he calls for alcohol to revive him. In like manner the Chinese woos his "white lady," the poppy flower. The Hindu chews Chang and the West African, Kola. Khat is more to the Yemin Arab than any of these to its devotees. It is no narcotic wooing sleep, but a stimulant, like alcohol. Unlike alcohol, it conceals no demon, but a fairy. The khat eater follows this fairy into regions overlooking paradise, therefore its name.

Catha edulis grows to some extent in Abyssinia but is cultivated chiefly in the mountains of the Yemin interior behind Aden. The name khat is said to be derived from the Arabic "Kut," meaning sustenance or reviving principle and refers to the most salient property of the plant, that of exalting the spirits and supporting the bodily strength. The researches of Alfred Beitler show that its active principle is an alkaloid in the form of crystals, very bitter and odorless. He named same "katine" and prepared different katine salts. He found that khat leaves also contain essential oils, tannin and mannite.

The author describes the cultivation, marketing, qualities, the action, public chewing houses, the part that khat plays at a wedding and his own experience chewing khat. For particulars the original, which is profusely illustrated, should be consulted.—*Nat. Geogr. Mag.*, Aug. 1917, 173–186. (O. R.)

Cereals and Legumes.—*Chlorine Content of.*—Balland publishes the result of the chlorine assay of oats, wheat flour, corn, millet, barley, rice, sago, tapioca, beans, lentils and peas, 51 varieties in all, mostly grown in France or in French colonies.

The method used was to mix 5 grammes of the powdered sample with 5 per cent. solution of chlorine-free potassium carbonate, drying, ashing, dissolving the ash in water acidulated with nitric acid, adding excess of tenth-normal silver nitrate V. S., and then titrating back with potassium thiocyanate V. S., ferric alum being used as indicator. He finds that the chlorine content of these foods is less than the phosphorus content. White cereals contain about 0.5 per cent. of phosphorus, they contain usually less than 0.06 per cent. chlorine. In legumes, the relation between phosphorus and chlorine are about the same as in cereals.—*J. pharm. chim.*, 15 (1917), 105.

Chicle.—*Industrial Chemistry of.*—F. Dannert points out that the import of chicle into the United States during 1916 was about 7,347,000 pounds, which represented about 30,000,000 pounds of finished chewing gum. The paper describes the methods employed in the commercial testing of chicle and enumerates 20 problems concerning chicle that are worthy subjects for industrial research.—*J. Ind. Eng. Chem.*, 9 (1917), 679.

Chicory.—*Detection of Beetroot in.*—E. Collin treats a quantity of the suspected substance with modified Labarraque solution, prepared by mixing 75 grammes of bleaching powder with 600 mls of water, intimately by trituration, the water being added in several portions. The mixture is filtered and a solution of 150 grammes of sodium carbonate in 400 mls of water is added, and after standing further filtration is resorted to. After such treatment all soluble coloring matter of the sample has been removed. The remaining dried substance is then examined microscopically. If beetroot was present, particles containing numerous black cells, filled with calcium oxalate, will be observed. The cells are either

elongated or oval, and are found in greater number near the vessels in the woody portion.—Ann. Falsif.; through C. U. C. P. Al. J., 24 (1917), 7. (G. C. D.)

Chillies.—*Export from Zanzibar.*—Natives having turned their attention to clove-raising, the chillies exported from Zanzibar decreased from 500,000 lbs. in 1905 to 125,887 lbs. in 1916. The price ranged from Rs. 14.59 to Rs. 17.56 per frasila (35 lbs.), the 1916 exports being valued at Rs. 66,086.—Chem. and Drug., 1965 (1917), 816. (K. S. B.)

Chrysarobin.—*Constituents of.*—O. Hesse finds that Goa powder consists of the anthranols chrysophanol, $C_{15}H_{12}O_3$, and emodinol, $C_{15}H_{12}O_4$, and their methyl esters. Emodinol methyl ether forms pale yellow needles melting at 184° ; chrysophanol methyl ether is not present in the chrysarobin now in commerce, which contains about 33 per cent. of chrysophanol. The therapeutic action of the drug is due to anthranols only; the substances insoluble in benzene take no part in it.—Apoth. Ztg.; through Pharm. J., 98 (1917), 353.

Cinchona Robusta.—This drug which is considered by some authors to be a hybrid of *C. officinalis* and *C. succirubra*, while others claim it to be a hybrid of *C. officinalis* and *C. calisaya* cannot be used for the manufacture of quinine because the percentage of this alkaloid in the bark is too small in proportion to the percentage of by-alkaloids. Generally the drug contains more cinchonidine than quinine. L. van Itallie and H. J. Lemkes give the results of analysis of barks of the different parts of the tree.

	Total alkaloids.	Quinine.	Cinchoni- dine.	Cincho-tan- nic acid.	Water.	Ash.
Bark of stem.....	6.84%	2.5 %	2.65%	8.4%	7.3%	2.84%
Bark of root.....	8.04%	2.1 %	2.25%	17.8%	9.9%	11.45%
Bark of twigs.....	3.9 %	1.25%	1.15%	2.7%	8.1%	4.18%
Chips.....	4.46%	2.03%	2.06%	7.4%	9.9%	4.14%

Whether or not *C. robusta* is suitable for pharmaceutical preparations in general is still in doubt, but its use may be of advantage in those proprietary medicines which contain chiefly by-alkaloids of cinchona.—Pharm. Weekblad, 54 (1917), 1225. (H. E.)

Cinchona Succirubra.—*Hothouse Cultivation of.*—J. Demilly finds that the best condition for growth is the hothouse at a tem-

perature of 16° to 18° . Analysis of the bark gave: Total alkaloids, 7.9 per cent.; basic quinine sulphate, 2.0 per cent. The plant grown in the hothouse contains as much as those growing wild. Demilly considers this curious fact of some use to those studying the role of alkaloids in plants.—Bull. Sci. pharmacology.; through Chem. Abstracts, 11 (1917), 1879.

Cinnamon.—*As a Prophylactic.*—Many years ago oil of cinnamon was adopted as a preventive of influenza and colds on the recommendation of Dr. J. Carne Ross, of Withington, Manchester, (Chemist and Druggist), and it has been sold extensively for these purposes by pharmacists in the form of simple essence or mixed with ammoniated tincture of quinine. The dose of oil of cinnamon which Dr. Ross recommended was five minims in a tablespoonful of water every hour until five doses have been taken, after that the same dose every two hours till the temperature becomes normal, when the dose should be taken four times a day for three days.—Pract. Drug., Oct. 1917, 38.

Cinnamon.—*Therapeutic Value of.*—Dr. W. B. Drummond states that the essence of cinnamon in twenty-five drop doses is one of the most effective remedies for coryza. With reference to the claim made for cinnamon as a preventive of measles, Dr. Drummond reports that he gave as much powdered cinnamon as would lie on a sixpence night and morning to twenty children in a hospital ward who had been exposed to infection by a nurse having German measles, and that at the end of four weeks no second case of German measles had occurred. Whether this negative result is *propter hoc* or merely *post hoc* may be an open question, but the balance of probability is in favor of the former inference.—Brit. med. J.; through Pharm. J., 98 (1917), 489.

Citrus Fruits.—*Volatile Oil Assay.*—C. P. Wilson and C. O. Young finds that extraction by means of volatile solvents does not give satisfactory results. After finely grinding the peel, mix 200 grammes with 700 mls of water, heat the flask with a small flame, connect the flask with a steam generator and distil rapidly in a current of steam until no more oil passes over. Usually the collection of 200 mls of distillate will prove sufficient. The distillate may be received in a flask with a narrow graduated neck and the

volume of oil directly observed. Multiplying the volume of oil at 25° C. by 0.846 will give the weight of oil contained in the peel.—J. Ind. Eng. Chem., 9 (1917), 959. (G. D. B.)

Cnidium Officinale.—*Constituents of.*—K. Sakei states that native practitioners of China, Japan and Korea use the roots of this plant extensively for various nervous diseases, especially those of the head and brain, and for some female disorders. "The chief ingredient of extracts of this drug is a volatile oil—oil of cnidium, which is present to the extent of about 0.82 per cent." The oil is yellowish brown, with a peculiar odor and a bitter taste, has a sp. gr. of 1.030 to 1.040, is levorotatory, insoluble in water and soluble in alcohol. The oil contains an unsaturated acid (formula $C_{12}H_{19}O_3$), and alcohol (formula $C_{10}H_{18}O_3$) and a compound with the formula $C_{12}H_{18}O_2$ (probably a lactone). The chief action of the oil is to stimulate the vaso-constrictors and raise the blood pressure; it stimulates the central nervous system, and increases the reflexes by reason of spinal irritation; it apparently has no action on the kidneys; in large doses the acid is able to produce hemolysis.—Jap. Med. Lit.; through Chem. Abstracts, 11 (1917), 2386.

Cocoa.—*Alkalinity of.*—Arpin states that the alkalinity of pure cocoa ash, calculated as potassium carbonate, should not exceed 2.75 per cent., according to the French law. In the event that this figure is exceeded, the product must be labeled "alkalized" or "soluble cocoa," which is to indicate that the cocoa has been treated with an alkali in the process of manufacture. Arpin states that he had occasion recently to examine samples, showing an alkalinity as high as 3.1 to 3.5 per cent., and where the matter of added alkali was rigidly excluded. He found that Madagascar cocoa beans regularly possessed an alkalinity of over 3.5 per cent. He concludes therefore that the alkali limit is set too low.—Ann. Falsif.; through C. U. C. P. Al. J., 24 (1917), 104. (G. C. D.)

Cocoa.—*Fat Assay of.*—H. Kreis heats one gramme of the sample with 20 mls of a 1.5 per cent. hydrochloric acid in a Schmidt-Bondzinski flask for one-quarter hour, preferably with the addition of a few pieces of pumice to prevent bumping. After cooling, 30 mls of ether are added, the mixture shaken for about 5 minutes and is then centrifuged for one-quarter hour with at least 1000

revolutions per minute. Twenty-five mls of the clear ethereal solution are decanted off, and evaporated. The residue is dried to constant weight.—Schweiz. Apoth. Zeit.; through Pharm. Weekblad, 54 (1917), 167. (H. E.)

Coffee.—*Substitutes.*—The agreeable and stimulating qualities of coffee as a beverage which have given it a world-wide commercial importance, have led to the exploitation of a number of substitutes, or rather imitations, or “pseudo-coffees,” since they do not contain all the qualities which give coffee its peculiar individuality.

Coffee contains 3 essential principles: a bitter febrifuge; an aromatic principle, caffeone, developed during roasting, and the stimulant caffeine. Since 1908 “decaffeinated coffees” have been marketed, which have been deprived by chemical means of the stimulant without losing their aromas. The pseudo-coffees do not possess the properties of coffee, but merely contain a bitter principle and deep colored infusion. Among other coffee substitutes are chicory (first used for the purpose by Valmont de Bomare in 1775); barley malt; cereals; acorns, deprived of their bitter principle by washing with alkali; hazel nuts; coffee lupine; the seeds of *Lupinus angustifolius*; chick peas; Spanish astragal, the seeds of *Astragalus boeoticus*; carob, the seeds of *Ceratonia siliqua*; the seeds of *Cassia occidentalis*; the fruit of *Galium aparine*; the seeds of *Gaertnera vaginata* and of *Psychotria herbacea*; okra seed; and figs. All of these pseudo-coffees must of course, be roasted before preparing the beverage.—Sc. Am. Supp., Dec. 1, 1917, 341. (O. R.)

Coffee.—*Substitute for.*—The latest German substitute for coffee is roasted grape skins, the odor and taste of which are said to have much resemblance to those of real coffee.—Chem. and Drug., 89 (1917), 769. (K. S. B.)

Crocus and Tulips.—*Poisonous Principles in.*—On account of the scarcity of feed in Germany the use of crocus and tulips has been recommended for fodder. R. Kobert reports that crocus contains a saponin and is not suitable as feed for pigs and other young animals, but that older animals tolerate the bulbs well. Tulips contain a heart poison, the alkaloid tulipine, which seems to be very nearly related to colchicine and solanine. The alkaloid, which was isolated by Kobert from Dutch tulip bulbs, is a strong poison for mice and dogs, but apparently cows are not in the least affected by it. Whether or not milk, especially uncooked; from cows fed

with crocus and tulip bulbs is fit for use has not yet been established.—Chem. Zeit.; through Pharm. Weekblad, 54 (1917), 993. (H. E.)

Cutch.—*Production in Burmah.*—Cutch is obtained from the wood of *Acacia catechu*. The trees are cut down while green, the bark removed and the wood reduced to small pieces by chopping. It is then boiled with water in large vessels, until the liquid upon cooling solidifies. There are different qualities of cutch, the best being obtained by boiling the heart-wood only. The article is brought into commerce in a number of forms, the chief ones being, (a) Small rectangular blocks, from 1 to 2 pounds in weight, and known as "Tablets;" (b) Irregular shaped blocks, some more or less square, weighing from 28 to 56 pounds and known as "Blocks;" (c) A liquid of thick consistence, known as soft cutch or "Baskets." The "Tablet" variety is the purer form, both "Blocks" and "Baskets" containing impurities, often in considerable quantity. Because of the relative cheapness of the "Baskets," however, a large quantity of cutch is exported in this form. Upon arrival at the shipping points, the cutch is packed into cases containing about 100 pounds, and is then ready to be exported. The industry is entirely under the supervision of the government officials, and licenses are granted annually to cutch manufacturers. The number of these licenses is decreased or increased by the Burmese government, according to conditions. The trees which yield cutch are found in abundance in all parts of Burmah, some of the districts, however, are so remote from shipping points, that the transportation charges make the industry unprofitable. Besides its use as a dye, cutch is employed in some countries for tanning.—C. U. C. P. Al. J., 24 (1917), 87. (G. C. D.)

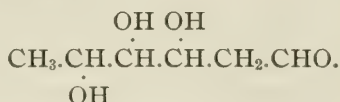
Darwinia.—*A New Species and Its Oil.*—Baker and Smith find that the leaves and terminal branches of *Darwinia grandifolia*, which is a new species, yielded 0.12 per cent. of volatile oil. The oil was red in color, somewhat mobile and had a terpene-like odor. In general characters and appearance it more closely resembled the oil of *D. fascicularis* than that of *D. taxifolia*; the chemical study of the oil indicated its intermediate position between those species. The crude oil showed sp. gr. 0.9150, $[\alpha]_D + 23.1^\circ$, $n_{20} 1.4773$. Saponification number 3.7 represents an ester not saponified in the cold with $2\frac{3}{4}$ hours contact, and as butyric acid was

detected during the determination of fatty acids it is possible that this ester is a butyrate. On redistilling the oil, the fraction b. p. 156–60° (30 per cent. boiling under 165°) had a pinene-like odor and showed sp. gr. 0.872, $[\alpha]_D + 41.6^\circ$, n_{20} 1.4685.—J. Roy. Soc. N. S. Wales; through Chem. Abstracts, 11 (1917), 2230.

Digitalis.—*Development of Glucosides in.*—Straub estimated the amount of glucosides present in different stages of the digitalis plant by determining in different fractions the lethal doses for a frog. It is pointed out that the seeds contain the glucosides digitalinum verum and digitalin and the leaves digitalein, digitoxin and gitalin. The glucosides of the seed were found to disappear during germination, being stored in the leaves, but do not increase further in quantity. Digitoxin and gitalin were found already in the youngest foliage leaves increasing in quantity until they amount to 1 per cent. of the dried matter. The surprising conclusion is made, that glucosides are only waste products.—Biochem. Zeitschr., 82 (1917), 48; through J. Chem. Soc. Abs. (A. V.)

Digitalis.—*New Physiologic and Chemical Examinations of.*—The question whether or not the digitalins act direct on the heart muscle or through the nervous system is still open. Mario Chio (Archiv. di Fisiologia 14, 261) has observed that the latter is the case. He found that an antagonism of the action on the heart of the frog exists between the juice of digitalis leaves and that of nicotine (on the heart in situ) and that of atropine (on the heart in situ or on the isolated heart). He therefore believes that digitalin exerts the same influence on the vagi as atropine; nicotine acts antagonistically on the sympathetic nervous system. C. G. Santesson and L. Strindberg (Skand. Arch. f. Physiolog. 35, 57) arrive at a similar conclusion. Digalen and strophanthin as well as gitalin according to A. Rising and digitoxin, the most active principle of digitalis, according to Kraft, like an infusion of digitalis increase the blood pressure in rabbits. Administered intravenously in doses of 2 Mgs. per kilo animal, intoxications are produced which are due to the action on the nervous system and not to a disturbance of the circulation. When administered subdurally, irritations are produced, for instance contraction of the pupils which are counteracted by atropine. The action of the heart tonics must therefore be ascribed, at least to some extent, to their influence on the blood vessel and on the vagi centra.

H. Kiliani (Archiv. d. Pharm. 254, 255) in continuing his studies on the digitalis glucosides found that Rising-Kraft's gitalin is a mixture; he describes a method for isolating from it a difficultly soluble product, the anhydro-gitalin $C_{33}H_{52}O_{12}$ which on hydrolysis like digitoxin, yields two molecules of digitose. In the manufacture of digitoxin on a large scale, another difficultly soluble glucoside which also splits off digitose on hydrolysis was isolated, the chemical study of which has not been concluded as yet. The examination of digitose has shown that by the action of nitric acid on the sugar in addition to dioxylglutaric acid also meso-tartaric acid is formed. The conclusion is therefore justified that the dioxylglutaric acid and digitose itself are meso-compounds, the structural formula of digitose being



Kiliani further describes a simple method to obtain digitonin from German digitalin. In the course of this investigation he succeeded in obtaining gitonin, which heretofore could be isolated only in the amorphous state, in crystalline form and he also obtained a new glucoside the chemical nature of which is under investigation at the present time. He further studied the digitagenic acid, the first oxidation product of digitogenin. He found that this acid, which has the formula $C_{32}H_{44}O_8$, by oxidation with chromic acid, is converted into another acid with just half the number of carbon atoms, $C_{16}H_{24}O_7$ and which contains at least one hydrated carbon ring. The sugars obtained from digitonin consist of digalactose and *d*-glucose; pentoses apparently are not present.

Another physiologic study on digitalins has been made by W. Straub (Biochem. Zeitsch., 75, 132). His investigations were made in order to find out whether or not the digitalins alone or the other non-glucosidal digitalis constituents (the "genins") also act on the heart. It was found that digitoxigenin and digitaligenin as well as cymarigenin and K-strophanthigenin change the heart beats of the frog in the same manner as the corresponding glucosides; however, the action of the latter is considerable stronger.—Pharm. Weekblad, 54 (1917), 1025. (H. E.)

Digitalis.—*New Researches.*—During researches upon digitalis E. P. Pick and R. Wasicky found that 25 per cent. alcohol exhausts it of all glucosides, including digitoxin, although pure digitoxin

(Merck) is insoluble in 25 per cent. alcohol, even in the presence of extract of digitalis. They found the M. L. D. of 1916 digitalis to range from 0.000262 gramme to 0.000285 gramme per gramme of frog. The 1908 crop, preserved in the presence of burnt lime, showed the same dose. Improperly stored leaves required a dose of 0.0018 gramme per gramme of frog. The authors suggest the obligatory standardization of digitalis to a dose of 0.0003 gramme per gramme of frog.—Chem. and Drug., 89 (1917), 320. (K. S. B.)

Digitalis.—*Pharmacology of Different Species.*—R. E. Morris made pharmacologic comparisons with a number of species of fox-glove grown by the Department of Pharmacy in Minnesota University. These include *Digitalis ferruginea*, *D. lutea*, *D. lanata*, *D. grandiflora*, and other species. All were found to equal *D. purpurea* in activity. *D. ferruginea*, *D. lutea* and *lanata* have a higher toxicity than the official drug. *D. lutea*, although highly toxic and ranking with the best grades of *D. purpurea*, was notably free from irritant and excitant properties. The difference in this respect was so great that it suggested the use of tincture of *D. lutea* for therapeutic purposes. This has been employed with the best results in the wards of the University hospital. If care is used in employing the standardized preparations of the drug in accurate doses there is no need to employ exorbitant priced extractives.—J. Am. Med. Assoc., 68 (1917), 1065.

Digitalis.—*Quality of Indian.*—After commenting on the lack of interest manifested in England prior to the war to the development of the drug plant industry citing as a striking example the "cornering" of Egyptian *Hyoscyamus muticus* by German chemical firms, Gordon Sharp describes Indian grown *Digitalis purpurea* that had been examined by him and found to be of excellent quality.—Pharm. J., 99 (1917), 108.

Digitalis Seed.—*Glucosides of.*—H. Kiliani by a new method of extraction obtained from digitalis seed, digitonin, gitonin and a new glucoside melting at 225–230°. From digitogenic acid, he prepared the methyl ether by the following reaction:



This melted at 137°. A similar ethyl ether, melting at 95° to 96° was also prepared.

Kilian also studied the carbohydrates obtained by the hydrolysis of digitonin and found that oxidation of the mixture with bromine water yielded dextrogalactonic acid; a syrup soluble in alcohol; and a viscous mass, which on oxidation yielded an acid forming barium, zinc and cadmium salts. While these salts resembled those of gluconic acid, they were not identical with the gluconates.—Ber. Chem. Ges.; through J. pharm. chim., 15 (1917), 159.

Digitalis.—*Standardization of.*—Marie Krogh describes a modification of Straub's method by which the isolated frog heart is fed through the aorta (the valves being destroyed) with Ringer solution, to which varying percentages of digitalis or strophanthus can be added. It is shown that the hearts of *R. esculenta* and *R. temporaria* behave quite differently. In *R. esculenta* the action of the drugs is a function of their concentration only, the heart being stopped by some definite concentration (0.00028 per cent. strophanthin crystalline, Thoms). The drugs are readily removed by washing with pure Ringer solution. In *R. temporaria* the action is a function of time also. The drugs are probably adsorbed by some substance in the heart, and are very difficult to remove by washing. The adsorption rates of strophanthin and digitalis appear to be different. For the standardization of digitalis preparations *R. esculenta* should be used. The strength of a preparation can be determined within 10 per cent. Size and seasonal condition of the animals do not seem to have any influence, and preparations containing alcohol or glycerol can readily be standardized.—Ugeskrift for Laeger 1917, No. 13; through Chem. Abstracts (1918).

Digitalis.—*Standardization by Hatcher's Method.*—W. Storm van Leeuwen has compared Hatcher's well-known cat method with Focke's frog method in standardizing digitalis preparations and found that the cat method is to be preferred to any other method because it gives a distinct end point and cats are not subject to seasonal variation and climatic conditions. The results obtained by the cat method vary only 5 to 10 per cent., while variations occurring in other methods are much greater. The author also recommends that the results obtained by Hatcher's method be expressed in terms of toxic value adopted by Focke. It was found that 25 mls of a one-half per cent. infusion of standard digitalis leaves used for killing one kilo cat represents a leaf with a value 3.—Pharm. Weekblad, 54 (1917), 890. (H. E.)

Digitalis Thapsi.—The histology and pharmacologic action of *Digitalis thapsi* are worked out by O. A. Farwell and H. C. Hamilton respectively, in a paper under this title. *Digitalis thapsi* was placed on the market under the name of Spanish digitalis, late in 1916, and this led to the investigation. Drawings, showing histological characteristics, accompany this paper. The pharmacologic tests show that the drug belongs to the digitalis series of heart tonics. The experiments thus far conducted, are sufficient to show that *Digitalis thapsi* possesses at least two of the properties of *Digitalis purpurea*; namely, the effects on the rate and amplitude of the heart beat.—*Am. J. Pharm.*, 89 (1917), 147. (R. P. F.)

Digitalis Therapy.—*As Relating to the Present Shortage in Drugs.*—R. A. Hatcher reviews the present status of digitalis therapy because of the shortage in some of the digitalis preparations caused by the war. He explains that all of the members of this group, including many crude drugs and their galenic preparations, as well as glucosidal active principles exert a qualitatively similar therapeutic action on the heart, but that the various members of the group vary enormously in their activity and in the rate of their absorption from the alimentary tract. While these differences have led physicians to give preference to certain advertised preparations with which they have been made familiar, a better understanding of the dosage and administration of the digitalis drugs will enable them to get the same results of the official and available digitalis drugs. Hatcher holds that in all cases requiring digitalis therapy digitalis itself, in the form of the powdered drug, the tincture, fluid-extract, extract or infusion may be used orally with the sole exception of those relatively rare instances in which immediate effects are imperative, and this requires intravenous or intramuscular administration. In these cases, strophanthin or crystalline ouabain gives the desired results.—*J. Am. Med. Assoc.*, 69 (1917), 1524. (W. A. P.)

Digitalis.—*Unusual.*—A. Nelsson found in a lot of *folium digitalis* imported from France leaves of unusual properties. The Hamner value came to 9 as against the best previous values of about 4. The ash is 16 per cent. which is unusually high. The color instead of the customary gray-green is brownish green. The leaf edges have small and irregular teeth. The hairs are longer than usual and of two kinds. Detailed histological description is

given including 3 microscopic drawings.—*Svensk Farm. Tidskrift.*; through *Chem. Abstracts*, 11 (1917), 2261.

Digitalis.—*Varieties Grown in Spain.*—E. M. Holmes finds in English commerce digitalis imported from Spain which consists of the leaves of *Digitalis thapsi*, *D. mariana* and *D. nevadensis*. *D. thapsi* have yellowish hairs and are also less decurrent into the petiole; *D. mariana* is remarkable for the hoary, white, dense, hairy coating of the leaves (especially when young) while the leaves are all stalked and the bracts are small and scale-like. A sample of *D. thapsi* on physiological assay was found to have the activity of 0.5 against 0.9 for genuine digitalis.—*Pharm. J.*, 98 (1917), 351 and 399.

Digitalis.—*Wild-grown American.*—G. B. Roth finds that the wild American digitalis of the Northwestern States compares favorably in activity with cultivated leaves. Results of physiological tests show that the wild growing digitalis of Oregon is above the U. S. P. standard.—*U. S. Public Health Rep.*; through *Drug. Circ.*, 61 (1917), 232. (C. W. B.)

Douglas Fir.—*Oleoresin of.*—The chief source of "Oregon balsam" is the Douglas fir, which is the oleoresin of *Pseudotsuga taxifolia*, which is obtained by tapping natural cavities in the wood of the tree, from which sometimes as much as three gallons are obtained by a single boring. A. W. Schorger has examined authentic samples of the oleoresin and finds that that from the heartwood of the tree contains a volatile oil consisting of highly rotary *l*-alpha pinene, with small amounts of *l*-limonene and *l*-terpineol; that the oil from the sapwood oleoresin consists of *l*-alpha pinene, *l*-beta pinene and probably *l*-limonene. He also considers the "firpene" of Frankforter as highly active *l*-alpha pinene.—*J. Am. Chem. Soc.*, 39 (1917), 1040.

Emodin-Bearing Drugs.—*Identification of.*—Beal and Okey, describe a number of tests for senna, cascara, rumex, rhubarb, frangula and aloes, and then give the following tentative scheme of identification. Shake a diluted alcohol tincture of the drug with 4 volumes of benzene. A portion of the benzene solution is shaken with 30 per cent. sodium hydroxide solution. A permanent light red to deep violet color indicates anthraquinone derivatives; a

bright red color, fading within 5 minutes, indicates phenolphthalein. To identify individual drugs, one portion of the tincture is shaken with benzene and then with amyl alcohol; and another portion is extracted with ether. The benzene extract shaken with stronger ammonia water gives a deep red-violet color and a red-violet precipitate if rhubarb is present. The amyl alcohol extract shaken with stronger ammonia water gives a deep red color in direct, and a dark green fluorescence in reflected light if aloes or a fresh cascara preparation is present. Verify by shaking another part of the amyl alcohol extract with mercurous nitrate solution, when there will be a red color in the aqueous layer if aloes is present. Evaporate another portion of the benzene or amyl alcohol extract, nitrate the residue and treat with stannous chloride solution, a deep red color indicates cascara; a yellow-brown indicates aloes. The ether extract on shaking with saturated nickel acetate solution gives a red aqueous layer if senna is present, while a green solution and precipitate suggests rumex. If the mixture on shaking with potassium hydroxide solution gives a violet precipitate, senna is indicated; if red-violet, rhubarb or frangula; if dark orange, cascara.

If the ether extract is evaporated and the residue nitrated and then treated with stannous chloride solution at 100°, a green color indicates senna; brown aloes; red, cascara; violet-red, rumex, rhubarb and frangula; lemon-yellow, phenolphthalein. If the foregoing residue is washed with water to remove excess of tin chloride and is then treated with solution of chlorinated soda, senna gives a red color, while all of the other drugs turn yellow.—J. Am. Chem. Soc., 39 (1917), 716.

Emodin-Bearing Drugs.—*The Identification of.*—W. S. Hubbard prepares the sample by evaporating a liquid to a pasty mass, acidifying with hydrochloric or sulphuric acid and extracting several times with ether, solid materials are powdered, acidified and extracted with ether.

Group test.—Use the Borntraeger test. Shake a portion of the ether extract with dilute alkali. If anthraquinone derivatives are present a red color will develop in the aqueous layer. Any color due to phenolphthalein will be discharged by the use of 10 per cent. sodium hydroxide solution.

Phenolphthalein is removed by Warren's method. Acidifying the aqueous extract with water will precipitate most of the com-

pound, when it can be removed by filtration. Neutralize the filtrate with ammonia water, evaporate to a thick syrup, and extract, after acidifying, with acetone. After driving off the acetone, take up the extract with dilute sodium hydroxide and add a slight excess of iodine test solution, followed by hydrochloric acid to acid reaction. The last traces of phenolphthalein are thus precipitated as the tetra-iodo derivative. Excess iodine is removed from the filtrate by sodium sulphate, the anthraquinones extracted with chloroform and in turn with a dilute solution of sodium hydroxide developing the characteristic red color.

Borax test.—Shake the ether solution with a saturated solution of borax. Aloes slowly gives a green fluorescence, rhubarb an old-rose-red color, cascara, brown and senna, occasionally light brown.

Rhubarb.—Underlay the ether extract with a solution of calcium hypochlorite. A red zone of contact will indicate rhubarb and if much is present a red precipitate will appear. By substituting a saturated solution of ferrous sulphate for the chlorinated lime the aqueous solution will be colored blue by rhubarb. Both of these tests should be positive before reporting rhubarb. Some samples of senna have been found to react with chlorinated lime. An extract of *Acer spicatum* gives the iron reaction. Istizin, or 1,8-dioxyanthraquinone, used similarly to these drugs, responds to the Borntraeger and sodium hypochlorite tests but does not react with ferrous sulphate.

Cascara gives a brown fluorescence with borax, but following the test for aloes as given in the U. S. P. IX, carrying the dilution to 500 mils, the fluorescence of aloes will predominate while the cascara color will not appear. The brown color may be regarded as positive for cascara, if rhubarb be absent.—J. Ind. Eng. Chem., 9 (1917), 518. (G. D. B.)

Ergot.—*History of.*—Beginning with Vauquelin's systematic research on ergot in 1816, Tschirch reviews the development of the biological, pharmacological and chemical knowledge of the drug. The numerous active bases isolated from ergot are classified into 3 groups: (A) *initial* bases, Ergotine, ergotoxine (hydroergotinine), vernine and ergothioneine; (B) *intermediate* bases, (1) acyclic: (Arginine, not isolated), agmatine, leucine, isoamylamine, choline, betaine; (2) with cyclic nucleus: (Tyrosine, not isolated), tyramine, uracil; (histidine, not isolated), histamine; (3) of unknown constitution: Cornutine, clavine, sphacelic acid, ergotic acid. (C) *decomposition and products* of B, among these cadaverine, putrescine,

aniline, trimethylamine and methylamine, also aspartic and amino-isovaleric acids. The structural relations of all these substances to one another and to adrenaline are shown. A special chart also indicates nature's synthesis of carbohydrates, albumins, nucleins, ergot bases and alkaloids in the plant. The chemical assay of ergot by determining cornutine is one-sided, but may give comparable results. Separate titrations of initial and of intermediate bases would be more scientific. Of physiological tests, the action of the substances isolated from ergot upon the uterus takes front rank, then follow tests for blood pressure. The cockscomb test is irrelevant. The century of ergot investigation is a singular example of the cultural co-operation of men of science of all countries.—Schweiz. Apoth. Ztg.; through Chem. Abstracts, 11 (1917), 2531.

Ergot.—*Physiologic Assay of.*—The therapeutic action of ergot seems to be chiefly due to the alkaloid ergotoxine but a chemical assay method for this substance is not available at the present time. But even if a chemical estimation of ergotoxine were possible it would by no means express the actual value of the drug which contains quite a number of other constituents which are more or less therapeutically active. W. Storm van Leeuwen therefore advises testing ergot and its preparations physiologically and for this purpose he recommends the estimation of their oxytocic action on the uterus of a virgin guinea pig by the well-known method generally applied. He found that by using only one-half of the calcium chloride prescribed in Tyrode's solution, spontaneous contractions of the uterus, which quite frequently take place, can be avoided. The ergot is standardized against a solution of β -imidazolyethylamine, containing 0.02 Mg. of this in each mil. A single uterus may be used for 10 or more experiments provided it is washed well after each determination. A loss in activity, however, amounting to as much as 20 per cent. has at times been noted. The maximum, medium and minimum contractions should be noted and compared with the corresponding ones provided by the β -imidazolyethylamine. The author further found that ergot preparations are rather stable and do not deteriorate as rapidly as is generally supposed.—Pharm. Weekblad, 54 (1917), 509. (H. E.)

Eucalyptus.—*Cause of Anti-Malarial Action.*—The mystery as to why the planting of eucalyptus trees in malarial neighborhoods produced a decline in malaria is now explained. It has been

demonstrated that, of nearly all trees, the eucalyptus absorbs the greatest amount of water. Seeing that blue-gums increase in height with great rapidity, often growing many inches a day in a hot position, the amount of moisture taken up increases on a greatly progressive scale; and this is just what brings about the downfall of the malarial mosquito. To complete its life-cycle it is necessary that this insect should pass its larval stage in pools of water. With the coming of the eucalypti these pools and, indeed, all marshy places disappear; the breeding spots of the mosquitos are gone, and in time the insects vanish altogether. The district is then free from malarial trouble simply because the carriers of the disease are not able to keep going.—Chem. News, 115 (1917), 216

Fir and Pine Resin.—*Properties of.*—C. G. Schwalbe obtained considerably higher yields of extractive matter when new wood was extracted with ether or alcohol, than resulted when old and seasoned wood was similarly extracted, more especially so when ether was used as a solvent. The ether extract was oily in character and yellow in color, and possessed a bitter taste. Alcoholic extracts yielded a brown resin which was quite brittle. In both extractives was found a considerable quantity of a fatty matter, consisting chiefly of glycerol esters of oleic and of other unsaturated acids, such as linolic and linolenic acids. The resins obtained from both extractives were hard and brittle. The resins obtained from the seasoned wood extracts possessed higher acid values than those obtained from the new-wood extracts. The iodine value was, however, lower.—Zeit. f. Forst u. Jagdwesen; through C. U. C. P. Al. J., 24 (1917), 103. (G. C. D.)

Flaxseed.—*Admixture of the Yellow and Brown Seeds.*—Kunz-Krause and Brandes states that the description of the drug in the fifth edition of the German Pharmacopœia excludes admixture of the yellow seed as distinguished from the 3rd and 4th editions. The authors find on investigation that such exclusion is unwarranted, not only with respect to size, weight and oil content of the grain, but also as regards the power of germination.—Arch. Pharm.; through Chem. Abstracts, 11 (1917), 2380.

Gentiana Germanica.—*Organic Crystalline Substances in.*—Molisch obtained yellow needle-like crystals of gentiolutein, when the dry leaves were subjected to microsublimation at moderate

temperatures. It occurs also in stems and flowers of *G. germanica* but not in a number of other species of *Gentiana* also tested. Another crystalline substance was obtained, when the leaf, after removal of the epidermis was immersed in water, or treated with 10 per cent. solution of mineral acids, phenol, alcohol or glycerol. The substances obtained were not identical with gentiopicrin nor gentianin.—Ber. Dtsch. bot. Ges., 35 (1917), 653; through J. Chem. Soc. (A. V.)

Ginger.—*Constituents of.*—H. Nomura describes a new body which he names zingerone, and which he states is a ketone (4-hydroxy-5-methoxyphenylethyl methyl ketone). The powdered ginger is extracted with ether, when a solution containing a ketone-phenol like substance is obtained. This is isolated by treatment with solution of sodium hydroxide, and subsequent liberation by carbon dioxide. Various impurities are removed by treatment with solution of sodium carbonate. The pure substance is finally obtained by distillation under reduced pressure. Zingerone forms colorless crystals, which melt at 40° to 41° C. It forms characteristic combinations with sodium bisulphite, a benzoyl derivative, an acetyl derivative, a methyl and an ethyl ether.—J. Chem. Soc., 111 (1917), 769. (G. C. D.)

Ginger.—*Pungent Principles of.*—James Grier reviews several papers published in the Journal of the Chemical Society. The methods of preparation, reactions, synthesis, chemical constitution, properties and compounds of gingerone, or zingerone (see above), and gingerol are considered in detail.—Pharm. J., 99 (1917), 172, 205 and 216. (C. W. B.)

Ginseng Root.—*Growth in Turkestan.*—Attention is called to the growth of ginseng (or zéne-schène) in the valley of the Amon-Daira River in Turkestan. The article describes the high esteem with which ginseng is regarded by the Chinese and mentions its cultivation in America.—Pharmazev. J.; through J. pharm. chim., 15 (1917), 24.

Goat's Rue.—*Lack of Galactagogue Effect.*—A. J. Carlson and Marian Lewis finds that goat's rue (*Galega officinalis*) is without influence on the milk supply of nursing goats and dogs. The Council on Pharmacy and Chemistry endorse the work and de-

clares the claimed galactagogue action of goat's rue unsubstantiated.—J. Am. Med. Assoc., 68 (1917), 1570. (W. A. P.)

Grapes.—*As Dietetic Preservative.*—Bertarelli says that the unfermented juice of grapes, and the pulp, when mixed with milk, ground meat, blood, and yolk of egg, seem to modify the protein, rendering it more digestible, as well as markedly increasing its keeping properties. This preservative property of grape juice is not yet explained. The author, however, states, that it is sufficiently effective to open out an important field of application to commercial dietetics in grape-growing countries. It is suggested that many new foods may be prepared with various combinations of proteins with grape products.—Gaz. deg. Ospedal.; through Drug. Circ., 61, (1917), 18.

Guayule.—*The Mexican Rubber Substitute.*—F. E. Lloyd has published a book on *Parthenium argentatum*, or guayule, the only plant producing rubber within the United States. A rubber company has purchased 7000 acres of land in Arizona and will attempt a systematic cultivation of the plant and the production of rubber therefrom.—Am. J. Pharm., 81 (1917), 384.

Gymnocladus Canadensis.—*Analysis of the Seeds of.*—Occasional cases of poisoning are reported from eating some part of the fruit of the Kentucky coffee tree which grows in the central states from Canada southwest to Nebraska and Kansas.

Following the death of a child from eating either the seeds, or the fruit pulp which the literature indicates as the commoner source of poisoning, L. E. Sayre and G. N. Watson made an analysis of the seeds supplied them and found saponin and a toxalbumin similar to if not identical with that of ricin, the poisonous principle of castor bean.

The roasted seeds are eaten without harmful results, all the cases of poisoning reported occurring when raw seeds are eaten. The poisonous principle evidently is destroyed by heating, a fact known to be true of saponins and toxalbumins.—J. Am. Pharm. Assoc., 6 (1917), 601. (Z. M. C.)

Helenium.—*Admixture with Belladonna.*—R. Eder examined a mixture of both roots, small cut, which figured in a forensic case. Particles of belladonna root were of lighter color and were separ-

ated mechanically. Its amount was 1.7 per cent. The starch test sharply distinguished both lots, and the alkaloids of belladonna were identified by known methods especially by the potassium bromide and bromine tests for hyoscyamine. Atropine crystals were not observed. Microscopic examination supported these results.—Schweiz. Apoth. Ztg.; through Chem. Abstracts, 11 (1917), 1725.

Helianthus tuberosus.—*Use as Food for Diabetics.*—Van Leersum recommends starch obtained from the tuber of *Helianthus tuberosus*, Jerusalem artichoke, as food for diabetics. The plant contains according to Thom's Real-Enzyklopedie 79.6 per cent. of water, 1.98 per cent. of nitrogen, 0.13 per cent. of fat, 15.1 per cent. of nitrogen-free extractive matter, 1.5 per cent. of cellulose and 1.17 per cent. of ash. The extractive matter consists chiefly of inulin, levulin and sugar.—Pharm. Weekblad, 54 (1917), 1381. (H. E.)

Helonias.—*Pharmacognosy of.*—John Moser explains the differences between this drug and aletris, and supplies the lucid illustrations of sections of *Helonias* rhizome shown below. (Figs. 6 to 9.)

The extensive use of this domestic drug in present-day medicine has led to its inclusion in the National Formulary, and the author points to the necessity for differentiation between this drug and aletris, due to the number of misleading synonyms, as well as errors and omissions in the official description of these two drugs.—Am. J. Pharm., 89 (1917), 291. (J. G.)

Henna.—*History of.*—Sir George Birdwood says that henna is the trade name of the *Lawsonia inermis* of Linnæus, the *L. alba* of Lamarck, commonly known as "the Egyptian Privet," and "the Jamaica Mignonette," a plant of the Natural Order Lythrarieæ, or Willow-worts of which the lovely "Purple Loosestrife" (the "*Lysimachia*" of Pliny) is the species best known to English people. It is said to be a native of Northern Africa, from whence it has spread into Palestine, Syria, and Persia, throughout India, and even into China, and across the Atlantic into the West Indies. It is the *gopher* of the Old Testament, translated in our Authorized Version (Song of Solomon i, 14) camphire: "My beloved is to me as a cluster of camphire in the vineyards of Engedi"—where it still abounds. It is the *κνπρος* of Dioscorides I, 24, and the "Cyprus in Egypt"

of Pliny XII, 22 (51). It is mentioned by the earliest Arabic writers on the botanical drugs of the East, and by the earliest modern European botanical explorers and writers, as by Belonius and Rauwolf in the sixteenth century A. D. The Homeric phrase, "Rosy fingered 'Hωσ" [the Sanskrit *ushas*, "brightening," and *Ushasa*, "Aurora"] also is recognized as obviously referring to the almost universal use by the women of the East of henna for coloring the tips of their fingers. The young girls of China use it to paint a rosy stripe between their eyebrows. It is also used throughout the East to redden the beards of the men, and to paint the manes and tails of horses. It is used also as a medicine; the roots made into a poultice for sore, worn feet, and as an application to ulcers; and the powdered leaves internally in leprosy. Its most interesting use is in burning the seeds as an incense to ward off evil spirits. The word "Henna" is the Arabic *hinna*, in Persian *hina*, in modern Greek *χιννα*, its Arabic name being connected with the verb *hana*, "to become queen."—J. Roy. Soc. Arts; through Pharm. J., 98 (1917), 308.

Henna.—*Dyeing Hair with.*—The method of using henna leaves in the dyeing of hair is not as well understood as it might be, and pharmacists who are supposed to be familiar with the use of the leaves are not always able to supply the necessary particulars. According to a note in the "Chemist and Druggist," henna is used along with reng (indigo leaves). First of all it is necessary that the process of dyeing should take place in a warm room, as at a low temperature the dye does not develop. Further, a large quantity of warm water must be available for the purpose of rinsing the hair. For one dyeing on an average 100 grammes of the mixture is used, and particular care must be taken that the ingredients are quite dry. The mixture is composed as follows:

For dyeing a light brown: 80 parts of reng and 40 parts of henna.

For dark brown or black: 90 parts of reng and 30 parts of henna.

Half a liter of water is gradually added to the mixed powders to form a smooth paste, which is thickly applied to the head and the hair, the hair having been previously freed from grease. For other details, the original article should be consulted.—Am. Drug., 65 (1917), 152.

Hops.—*Arsenic in.*—European importers of American hops have for years complained of their arsenic content and many shipments

have been rejected. The U. S. Bureau of Plant Industry has investigated this matter and reached the conclusion that the use of impure sulphur in the process of bleaching is responsible for the presence of a trace of arsenic in hops. Samples of sulphur used for fumigating contained over 100 parts of As_2O_3 per million.—Sc. Am., Sept. 29, 1917, 223. (O. R.)

Hops.—*Use as Tobacco Substitute.*—Old hops are said to be used in Germany as a tobacco substitute.—Chem. and Drug., 89 (1917), 1015. (K. S. B.)

Horehound.—*Sophistication of.*—The Service and Regulatory Announcements of the U. S. Department of Agriculture state some recent importations of so-called "horehound" consisted of *Ballota hirsuta*.—Am. J. Pharm., 89 (1917), 550.

Horse Chestnut.—*Attempted Utilization.*—A. Goris has attempted to make the seeds of horse chestnut edible, but without marked success. Not only must the saponin be removed by washing with diluted hydrochloric acid (1-1000), but even then the meal is apt to contain fragments of the integuments giving it an astringent taste.—Compt. rend.; through J. pharm. chim., 16 (1917), 286.

Hydrustis.—*Cultivation in Austria.*—This valuable plant has now been successfully acclimatized in Austria. The drug yielded is of better quality than was anticipated, and is equal, or even superior to the American as regards the percentage of alkaloid contained in it.—Pharm. Ztg.; through Pharm. J., 99 (1917), 29.

Hydnocarpus Alcalæ.—*Seeds of.*—H. C. Brill tested these seeds for a cyanogenetic glucoside with negative results. However the fresh or unripe fruit might contain such substances. Oil from these seeds was examined for its physical and chemical constants, and both seeds and oil were fed to chickens with no apparent ill effects. More than 90 per cent. of the free acids in this oil were found to consist of a compound identical in properties with the chaulmoogric acid described by Power. The combined acid was chiefly palmitic with only traces of oleic, in contrast to the oil from *Pangium edule*. Both oils differ in melting point from the oils from chaulmoogra

and Hydnocarpus reported by Power and his co-workers.—Philipp. J. Sci.; through Chem. Abstracts, 11 (1917), 3381.

Ilex Paraguayensis.—*Constituents of.*—A. Olivet discussed the agriculture of yerba mate or Paraguay tea and then quotes the analyses made by Peckolt, Moreau and Padé, the latter analyzing only the ash. Olivet repeats Moreau's statement that the ash approximates the saline character of Vichy water, which explains the digestive value of mate. The popularity of mate as a medicine in Europe is also discussed.—Boletin de la soc. fomento fabril; through Chem. Abstracts, 11 (1917), 2262.

Insect Powder Plant.—*Cultivation of.*—E. M. Holmes points out the need of the cultivation of this plant in England. He quotes a report made by D. H. Faes in the Journal "Suisse de Pharmacie" of work in this direction done at the Station Viticole de Lausanne. The conditions that suit the Dalmatian plant, *Chrysanthemum cinerariæfolium*, are sunny, pebbly, calcareous hillsides, dry and without irrigation. The seeds are sown toward the end of March on rich, light soil and the seedlings are pricked out in the following March. The plants are arranged in furrows on rocky slopes of hills. Only about 50 per cent. of the seedlings are suitable for pricking out and out of each 100 of those set out 15 to 30 perish. Flowering commences about May 20th, the flower-buds are collected in the middle of May, or, if the weather is damp, in June, and a second gathering is made in August or September. Each plant yields 80 to 150 flowers, each weighing about 0.5 gramme and a laborer can gather 1500 to 2500 flowers a day. 100 kilos of fresh flowers yield 25 to 33 kilos of dry ones.—Pharm. J., 98 (1917), 6.

Insect Powder.—*Japanese.*—The supply of insect flowers from Austria having been shut off on the outbreak of the war, the world's demand turned suddenly to Japan, and the export having been increased greatly in consequence, planting has been much encouraged, and has extended in the producing centers, which comprise Hiroshima, Okayama, and Wakayama Prefectures. According to a Japanese contemporary, for 1916 the export of insect flowers amounted to 1,358,673 kin in quantity and Y720,287 in value, and that insect powders to 616,609 kin and Y417,842, making the total value Y1,133,129. This year the yield of insect flowers is expected to be much greater, and is estimated at 1,155,000 kwamme.—Pharm. J., 99 (1917), 251.

Ipecacuanha.—*Two New Alkaloids of.*—In the second part of his paper on the alkaloids of ipecac, E. L. Pyman described two new alkaloids. Both are ether-soluble and non-phenolic in character. They were found in the mother-liquor after the crystallization of emetine hydrobromide, and were isolated together as crystalline acid oxalates, their separation being accomplished by making use of their different basicities. The one present to the larger extent (0.015 to 0.033 per cent.) was found to be the *o*-methyl ether of psychotrine; it is an amorphous base, forming well crystallized salts, and gives a crystalline *n*-benzoyl derivative. The base and its salts are dextrorotatory. It may be prepared synthetically by the methylation of psychotrine or by the oxidation of emetine. Upon reduction it yields emetine along with other compounds. The other new alkaloid, emetamine, is present to the extent of 0.002 to 0.006 per cent. It is a crystalline base, forming crystalline salts, and does not form a benzoyl derivative. The base is dextrorotatory, while the salts are levorotatory. The probable formula is given as $C_{29}H_{36}O_4N_2$, and differs from emetine by containing two unsaturated bonds.—Chem. and Drug., 89 (1917), 392. (K. S. B.)

Jute Seed.—*Raffinose in.*—H. E. Anentt exhausted finely ground jute seed with ether and with petroleum benzin. The residue is subsequently exhausted with alcohol. It was found that the addition of ether to the alcoholic extract resulted in the production of a copious white precipitate. This was dissolved in hot 80 per cent. alcohol, the solution filtered and set aside to crystallize. Interlaced white needles resulted, and these were subsequently purified by repeated crystallization from hot 80 per cent. alcohol. The sugar obtained in this manner does not form an osazone, nor does it reduce Fehling's solution. This saccharine substance was identified as raffinose, and the amount present in the jute seed under examination was found to be about 2.25 per cent.—Biochem. J.; through C. U. C. P. Al. J., 24 (1917), 148. (G. C. D.)

Karaya Gum.—In a short anonymous article taken from Scientific American, attention is called to the fact that the increasing amounts of this gum are being imported into this country. It is now known that it is the product of *Sterculia urens*, a tree of the cola nut family. The gum belongs to the tragacanth series and is

easily mistaken for true gum tragacanth. It is used as an emulsifying agent for which it is equal to tragacanth. Large quantities are used in ice creams and other foods.—J. Am. Pharm. Assoc., 6 (1917), 88. (H. H. S.)

Kauri Gum Oil.—*New Zealand Production.*—The U. S. Consul General at Auckland, New Zealand, reports that a company has been organized to extract kauri gum oil from peat taken from the swamps in the North Island. It is claimed that the peat yields 20 to 30 gals. of oil per ton. About 25 per cent. of the oil resembles gasoline.—Chem. and Drug., 89 (1917), 668. (K. S. B.)

Kava-Kava.—*Therapeutics of.*—Dr. John Orr thinks it strange that kava has, until now, been left out of the Pharmacopœia. As far back as 1891 he has tried it with success in a case of septic cystitis which had resisted all efforts to improve the septicity of the bladder and urine. The remedy was almost at once beneficial. The most convenient form for internal administration is the official fluidextract. The local action of kava in solution is that it first irritates sensory nerve-endings in the skin and mucous membranes, and then depresses them, in much the same way as cocaine, but the painful effect of its initial action renders it unsuitable for anæsthetising mucous surfaces. Internally it is an aromatic bitter, and much like pepper. The resins have a stimulating and antiseptic action on the urinary system, causing diuresis by stimulating the renal epithelium, and leading to increase in the urinary secretion. At the same time, the antiseptic action exerted by the resins tends to reduce or abolish organismal growth in the urinary tract and to sterilize the urine. In cases of subacute and chronic affections of the urinary passages it will be found of distinct service. Its use in acute cases is undesirable. Chronic pyelitis, cystitis, prostatitis, and urethritis, which have passed the acute stage, will be materially improved by suitable doses of the liquid extract, and ordinary bacteriuria, occurring as it so often does unassociated for a time with inflammatory reaction, will be found to yield to the systematic use of kava. Kava is excreted in part by the glands of the skin, and exercises a stimulating action on these glands. From time to time it happens that an over-stimulation of the cutaneous glands takes place, with the result that a rash develops of a rather unpleasant character; its occurrence, however, is relatively infrequent.—Prescriber; through Pharm. J., 99 (1917), 270.

Kermes Oak.—*The Bark of the Root of.*—This drug is used by the Arabs of North Africa under the name "*Dbar'at*," as a remedy for diarrhea and dysentery. It occurs in unequal and irregular fragments more or less curved or rounded, and possesses a fibrous fracture. Its exterior face is reddish brown with a corky layer 4 to 8 Mm. thick, showing many transversal ridges and numerous cracks extending down to the liber. On the internal face, the liber is fawn colored. L. Arnold has analyzed the bark and found 0.73 per cent. fat, 0.3 per cent. of gallic acid, 0.22 per cent. of resins, 19.2 per cent. of tannin and phlobaphenes that combine with hide, 16.5 per cent. of tannin precipitated by zinc acetate, 2.7 per cent. of phlobaphenes, 0.4 per cent. of bitter principles, 0.26 per cent. of reducible material, 0.7 per cent. of pectic matter, and 70.19 per cent. of cellulose and water.—J. pharm. chim., 15 (1917), 318.

Lichens.—*Constituents of.*—O. Hesse finds in *Evernia furfuracea*, var. *olivetorina*, atranorin, olivetoric acid and two new acids olivoric acid ($C_{23}H_{28}O_8$; m. p. 115–116°), and apo-olivoric acid.

In *Parmelia saxatilis*, var. *retiruga*, he finds atranorin, saxatic acid and protocetraric acid.

In *Cetraria islandica*, he finds proto- α -lichenstearic acid ($C_{18}H_{30}O_5$; m. p. 107–108°; changing to α -lichenstearic acid when treated with acetic anhydride and to lichestronic acid by treatment with alkali); cetrarin, melting at 228°; and two carbohydrates, lichenin and isolichenin. The latter is composed of dextro-lichenin, $C_{12}H_{22}O_{11}$, melting at 270–280°, and lichenoin, $C_{12}H_{20}O_{10} \cdot 4H_2O$, which is rubbery and has a rotation $\alpha_D = 202.7$. The carbohydrates on hydrolysis yield dextrose, some *d*-galactose and traces of mannose. Hesse finds that cetraria does not contain free cetraric acid, but that this is formed in the method of extraction with alcohol from the fumar-protocetraric acid that the lichen contains.—J. prakt. Chem.; through J. pharm. chim., 16 (1917), 314.

Lime Juice.—*Grenada Export.*—The exports from Grenada in 1916 were 150,525 gals. of raw juice and 7,500 gals. of concentrated juice, of a total value of £14,486.—Chem. and Drug., 89 (1917), 1099. (K. S. B.)

Lophophora.—*An Aztec Narcotic.*—W. E. Safford, after comparing the accounts of the use of narcotics by the ancient Mexicans

and by the Indians of the present day, has no doubt that the mushroom-like peyote used by the Indians in the United States is the same drug as was called "teonacatl," or "sacred mushroom," by the Aztecs. The ancient Mexicans, like the Huicholes and Tarahumaris of the present day, obtained their supply through the medium of messengers consecrated for the purpose, who observed certain religious rites in collecting it and who were received on their return with ceremonial honors. Although the Indians on the northern reservations now receive it through the medium of the parcel post they attribute to it the same divine properties as the ancient Mexicans and, like them, combine its worship with the religion they have received from the Christian missionaries. Many of the Indians who use the narcotic declare that they take it as a kind of sacrament or communion and that it helps them to turn from wickedness and lead good lives. This is the first time that the identity of the "sacred mushroom" of the Aztecs with the narcotic cactus known botanically as *Lophophora Williamsii* has been pointed out. That it should have been mistaken by the early Spaniards for a mushroom is not surprising when one notices the remarkable resemblance of the dried buttons to peltate fungi, and also bears in mind that the common potato on its introduction into Europe was popularly regarded as a kind of truffle, a fact which is recorded by its German name, Kartoffel or Tartuffel.—J. Heredity; through Pharm. J., 98 (1917), 48. .

Lucæna Glauca.—*A Philippine Coffee Substitute.*—H. C. Brill states that the roasted, ground seeds of a Philippine leguminous shrub, ipel-ipel, *Lucæna glauca*, yield when infused with hot water a brown liquid with a coffee-like aroma, which is used as a beverage. It has, however, the disadvantage of showing a deep green fluorescence in the brown liquor by reflected light. After hydrolysis with hydrochloric acid, the infusion reduces Fehling's reagent. An analysis given enumerates the carbohydrate albuminoid and fatty constituents of the seeds, but no mention is made of the isolation of any glucoside or alkaloid.—Philipp. J. Sci.; through Pharm. J., 98 (1917), 319.

Manna.—*A Study of Some Commercial Samples.*—After an investigation of several specimens of manna which were slightly substandard as regards solubility in 90 per cent. alcohol, an attempt

was made by Chas. H. LaWall and LeRoy Foreman to obtain samples of various ages and qualities in order to make a comparison of some of the chemical and physical properties with those of the suspected samples. The data obtained by the authors are presented in tabulated form and their conclusions are that there is urgent necessity for further work upon authentic specimens and that the statements of mannite content have been in all probability grossly inaccurate, due to lack of correct knowledge of the subject. The favorite statement in literature seems to be that manna contains 80 to 90 per cent. of mannite. Some authorities qualify the statement as is done in U. S. Department of Agriculture F. I. D. 162, in which among other requirements adopted, is mentioned mannite (soluble in 90 per cent. alcohol), not less than 75 per cent. The U. S. P., however, makes no mention of any of these factors as requirements, although the Swiss Pharmacopœia since 1907 has required a 90 per cent. alcohol-soluble factor of not less than 75 per cent. and a maximum of 10 per cent. of moisture and 3 per cent. of ash.

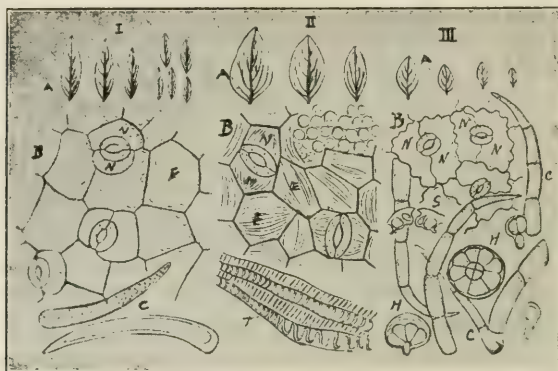
Inasmuch as there is a great difference between true mannite and the substance soluble in 90 per cent. alcohol, it is time to discard the use of the term mannite in regard to this alcohol-soluble substance.—J. Am. Pharm. Assoc., 6 (1917), 22. (L. S.)

Mastic.—*Its Oriental Uses.*—John Uri Lloyd discusses the history, properties and uses of gum mastic in an interesting paper under this title. The world supply of this gum is obtained from the district known as Mastikohoria in the Island of Chio. Mastic is gathered from June to September, the process being disturbed by the excessive rains. About 200,000 Kg. are produced annually, of which about 170,000 Kg. are exported. In the Orient it is used as a breath perfumer, and in the preparation of an alcoholic drink known as Raki or Rakee. It is also used largely in the form of a confection. Formulæ for both the foregoing are contained in this article.—Am. J. Pharm., 89 (1917), 1. (R. P. F.)

Mate.—*Caffeine Content of.*—L. P. J. Palet notes that in 1843, Stenhouse reported that mate contained only 0.13 per cent. of caffeine, while in 1854, he reported 1.20 per cent. Palet has found that the 1843 figures were based upon a faulty assay process and they should not, therefore, be used as a standard.—Anales soc. quim. Argentine, 5 (1917), 92; through Chem. Abstracts (1918).

Marjoram.—*Adulteration with Coriaria.*—Henry Kraemer points out that *Coriaria myrtifolia*, which contains a narcotic principle, much like picrotoxin in its physiological action, has been found as an adulterant in marjoram. This same leaf was used as a senna

Fig. 6.



- I. Senna.
 - A. Entire leaves of Senna, the larger being those of India Senna and the smaller on the right leaves of Alexandria Senna.
 - B. A surface section of the lower surface showing three stomata, each having the neighboring cells (N) parallel with the pore of the stoma.
 - E. An epidermal cell having a polygonal outline.
 - C. Two of the simple non-glandular hairs, the lower one being seen in section and the upper showing the Papillose surface.
- II. Coriaria.
 - A. Entire leaves.
 - B. Surface view of the lower epidermis showing two of the stomata with two neighboring cells which are situated parallel to the pore of the stoma.
 - E. The epidermal cells showing a striated cuticle similar to the neighboring cells.
 - T. Several of the tracheae.
- III. Marjoram leaves.
 - B. Surface view of the lower epidermis showing three stomata, the neighboring cells (N) being at right angles to the pores of the stomata.
 - C. Uniseriate non-glandular hairs.
 - H. Typical 8-celled glandular hairs.
 - S. Transverse section through lower epidermis showing two of the stomata and the neighboring cells.

adulterant years ago. The histological characteristics are given in the appended illustrations (Fig. 6).—*Pacif. Pharm.*, 11 (1917), 13. (C. M. S.)

Marjoram.—*Adulteration with Coriaria.*—C. H. LaWall calls attention to the fact that the foreign journals for some time had been giving warning that this drug was being adulterated. He states that for two years the market in this country has been trading lots of French marjoram contaminated with finely broken leaves of *Coriaria myrtifolia*, as much as 10 to 20 per cent. of adulterant being found.—*Proc. Penna. Pharm. Assoc.*, 40 (1917), 241. (J. K. T.)

Melon Seed.—*Use for Tapeworm.*—The *Lancet* quotes from a report by Dr. C. J. de Jongh, of The Hague, of the occurrence in his practice of a case of infection with *Tænia nana*, the smallest of the tapeworms infesting the human subject, which measures only about half an inch in length, and a fiftieth of an inch in breadth. Treatment with santonin gave negative results, but the exhibition of 250 of the seeds of *Cucurbita pepo*, followed by a dose of castor oil, cleared out the parasite, and the girl made a good recovery. Cases of infection with this parasite are considered rare, probably because of the difficulty of detecting its presence in the alvine dejecta. The life-history of *Tænia nana* is still obscure, and it is not known what animal serves as in intermediate host to it, but possibly the human subject may serve as well in that capacity as for its mature form.—*Pharm. J.*, 98 (1917), 307.

Meroola Nuts.—*Constants of Oil from.*—Meroola nuts, the seeds of *Sclerocarya caffra*, are found in the Northern Transvaal. They weigh from 3 to 4 grammes and measure about $\frac{1}{2}$ by 1 inch. They consist of 87.9 per cent. of very hard shell and 12.05 per cent. of kernel which has a pleasant, nutty flavor, and should be very nutritious as a food. Upon ether extraction, these kernels yield from 5 to 6.3 per cent. of a pale yellow oil having the following constants:

Specific gravity at 15.5° C.....	0.9153
Acid value (as oleic).....	1.59
Saponification number.....	19.1
Unsaponifiable matter.....	0.93%
Wijs' iodine number.....	72.9
Glycerol.....	10.6%
Hehner number.....	94.7
The fatty acids probably consist of:	
Stearic and palmitic acids.....	9.0%
Oleic and linoleic acids.....	91.0%

Linolic acid is absent.—*Chem. and Drug.*, 89 (1917), 68. (K. S. B.)

Mustard Seed.—*Standard and Assay.*—White mustard, the seed of *Sinapis alba*; black mustard, the seed of *Brassica nigra*; and other mustards, such as the seed of *Brassica juncea* and *Brassica cernua* should contain not more than 5 per cent. of other seeds and should yield not more than 5 per cent. of total ash nor more than 1.5 per cent. of ash insoluble in hydrochloric acid. All except white mustard should yield not less than 0.6 per cent. of volatile oil calculated as allyl isothiocyanate.

The suggested method of assay includes maceration of the ground seed with water; addition of alcohol and distillation into a flask containing ammonia water. To the distillate a known amount of tenth-normal silver nitrate is added and after standing over night, the mixture is heated to boiling to agglomerate the silver sulphide, after which an aliquot part is titrated with tenth-normal ammonium thiocyanate, ferric alum being used as indicator.—Service and Regulatory Announcements, U. S. Department of Agriculture; through *Am. J. Pharm.*, 89 (1917), 550.

Opium.—*Ammonia in.*—Jitendra Nath Rakshit states that small quantities of ammonia, contaminated with traces of another base, possibly isoquinoline, occur in opium and become quite apparent when one assays this drug by the method of the British Pharmacopœia. These bases are not derived from decomposition of the alkaloids present. The amount of mixed bases present, estimated as chloride, varies from 0.069 gramme to 0.095 gramme in 10 grammes of opium.—*Pharm. J.*, 98 (1917), 255. (C. W. B.)

Opium.—*Extraction of Morphine from.*—P. Carles discusses the possibility of extraction of morphine from opium. He finds that pure distilled water completely removes the morphine from crude opium, but because of the physical condition of opium, extraction of large masses is by no means easy. When the volume of the solvent is limited, as in pharmacopœial recipes, it is not surprising that an appreciable amount of morphine remains in the marc. In marking laudanum, a double maceration and expression, with due regard to final proportions, is advisable.—*J. pharm. chim.*, 15 (1917), 46.

Opium.—*Hong-Kong Exports and Imports.*—The imports and exports of opium at Hong-Kong during 1916 were: Imports, 35

chests; exports, 263 chests.—Chem. and Drug., 89 (1917), 765. (K. S. B.)

Opium.—*In Diabetes.*—K. O. af Klercker finds that the inhibiting action of opium on hyperglucemia previously observed in experiments on animals, after ingestion of carbohydrates, is also manifested in human diabetes. It is concluded that this is an indirect result of the inhibiting effect of opium on the evacuation of the stomach. It may also act more directly on the increase of glucose in the blood during fasting and thus diminish both hyperglucemia and glucosuria.—Dtsch. Arch. Klin. Med.; through Pharm. J., 98 (1917), 439.

Opium.—*Production in Japan.*—The Japan "Chronicle" states that as a result of the greatly reduced imports of chemicals and medicines after the outbreak of the war, the domestic demand for opium greatly increased. Therefore the government has encouraged the cultivation of the poppy and the production of opium. The output accordingly increased to 2525 pounds last year.—Sc. Am., Sept. 1, 1917, 166. (O. R.)

Oranges.—*Effect of Fertilizers on.*—Oranges grown at the California University Citrus Experimental Station were not materially different when potash or phosphate was employed. The use of nitrogenous fertilizers, such as manure, resulted in the production of a coarser fruit, with a somewhat lower sugar content, and less juice. The same result was obtained when the nitrogenous fertilizer was used with either potash or phosphate, or with both. It was also established that in all instances where nitrogen was applied, the fruit contained a larger per cent. of this element.—C. U. C. P. Al. J., 24 (1917), 64.

Pangium Edule.—*Glucoside of.*—H. C. Brill found that the seeds of *Pangium edule* contained a glucoside which appeared to be identical with that found by DeJong in the leaves of *P. edule* and by Power, *et al.* in *Gynocardia odorata* and named by them gynocardin. Brill's methods of extracting this glucoside, also an oil from the seeds, and an enzyme, gynocardase, from the leaves of *P. edule* are given in detail. The rate of hydrolysis of gynocardin by emulsin or by acids is much slower than the rate of hydrolysis of amygdalin by the same agents. A similar difference of rate was

observed by hydrolyzing these glucosides with crab juice. Gynocardin given in doses of 0.25 to 1 gramme to guinea pigs was without apparent effect. The enzyme gynocardase hydrolyzed amygdalin about twice as rapidly as gynocardin, and since it hydrolyzes both glucosides it must, like emulsin, belong to the class of β enzymes. The oil content of dried kernels of mature seeds was 42.67 per cent., and of immature seeds 36.38 per cent. The physical and chemical constants of the oils are given, showing a decided difference between the oils of mature and of immature seeds. Oleic, a smaller amount of palmitic, and an optically active acid were found.—Philipp. J. Sci.; through Chem. Abstracts, 11 (1917), 3381.

Phaseolus Lunatus.—*Poisonous Varieties of.*—W. R. Dunlop states that this plant is the source of many different kinds of tropical beans, some of which are edible, others poisonous. The poisonous principle is prussic acid, and although the production of this poison in seeds from cyanogenetic glucosides has been carefully investigated, our knowledge is not complete enough to allow of the statement that there is a definite coincidence between the presence of the poison and the color of the seed, nor are the chemical facts sufficient to show whether the glucoside may not occur without the ferment in some cases, and *vice versa*. Up to the present two facts may be stated, the dark purple bean (Java bean) is deadly poisonous, and the creamy white Lima bean is perfectly wholesome.—West Indian Bull.; through Pharm. J., 98 (1917), 257.

Phaseolus Lunatus.—*Poisonous Varieties Denied Entry.*—Beans offered for entry into this country from India or the East Indian Colonies, commonly known as Indian, Java, Kratok, Moon, Rangoon, or Burma, and representing certain varieties of *Phaseolus lunatus*, have been found to contain hydrocyanic acid. The importation of trade in these beans is restricted in certain European countries. The U. S. Department of Agriculture will recommend the exclusion of any importation of beans which upon examination are found to contain any appreciable amount of hydrocyanic acid, on the ground that they might be dangerous to the health of the people of the United States.—Pract. Drug., Sept. 1917, 38.

Phaseolus Lunatus.—*Poisonous Varieties of.*—L. Grignard reports that Burma beans (*Phaseolus lunatus*) which had been im-

ported into France for purpose of food, were found to contain 0.025 per cent. of hydrocyanic acid, which quantity is somewhat above the permissible amount. For purpose of detecting the acid the isopurpurate reaction was employed, as follows: 2 grammes of the powdered bean substance were placed in a flask and mixed with 10 mils of water. A piece of filter paper, previously moistened with a solution of 1 gramme of picric acid and 10 grammes of sodium carbonate in 100 mils of water, was suspended in the flask. In cases where hydrocyanic acid was present, an orange-red coloration developed within 12 hours. In order to determine the quantity of acid present, 20 grammes of the powdered bean substance were macerated with water for a period of 12 hours, after which steam distillation was resorted to. The distillate was finally titrated with silver nitrate with the proper indicator.—*Am. Falsif.*; through C. U. C. P. Al. J., 24 (1917), 7. (G. C. D.)

Piassava.—*Vegetable Horsehair of Madagascar.*—H. Jumelle states that this article is furnished by two species of palms, *Vonitra thouarsiana* and *Vonitra utilis*. The article describes the two plants, and especially the petiole sheath from which the so-called "horsehair" is obtained.—*J. pharm. chim.*, 16 (1917), 219.

Pinus Sabiniana.—*Constituents of the Cones of.*—L. J. Ostlund after a study of the cones of Digger's Pine publishes the following data:

The Seeds.—The examination of eleven medium sized cones revealed the presence of an average of 143 seeds per cone, weighing about one gramme each. The average weight of a cone was 610 grammes, 100 grammes of seeds yielded 23.2 grammes of kernels, which in turn yielded 46.5 per cent. of a bland oil when extracted with heptane. The heptane used being obtained by fractionating the oleoresin of the Digger's Pine. The whole seeds when finely ground and subjected to continuous extraction with ether yielded 11.8 per cent. of a thick, dark yellow oil. The kernels subjected to expression produced a viscid colorless oil having the specific gravity of 0.958 and corresponding to 6.1 per cent. with reference to seeds. The expression was imperfect.

The Fatty Oil.—Examination revealed the following physical and chemical constants:

	Sp. gr. at 20° C.	Saponi- fication value.	Iodine. value.	Acid value.
Oil obtained by extraction of kernels...	0.952	...	..	..
Oil obtained by extraction of seeds....	0.921	136.9	94.6	42
		138.0	..	44
Oil obtained by expression of kernels...	0.958	146.0	108	56
		147.2	..	54

The quantity of oil obtained by extraction of the kernels was too small for extended examination. The difference in the other two is due to the different methods of extraction employed and the difference from No. 1 may readily be accounted for in the fact that the last two represented both the oil from the kernel and the seed coat.

The Oleoresin from the Cones.—When oleoresin of the Digger's Pine is referred to, that from the wood is generally implied. That which oozes from the tips of the scales of the cones is quite different in composition and appearance. It is sulphur-yellow when fresh, clear and transparent, but becomes brittle and loses its transparency and softness on prolonged exposure. About 1 per cent. was obtained but more would undoubtedly be obtained by use of solvents. It had the saponification number 152.9 and the acid number 147. The distillation of a number of fresh cones several years ago yielded a few mls of a volatile oil which thickened before it could be investigated.—J. Am. Pharm. Assoc., 6 (1917), 242. (L. S.)

Pinus Sylvestrus.—*Oleoresin from.*—This product is now collected in large quantities in Germany on account of the scarcity of colophony and turpentine. An improved method for gathering the balsam was described in the "Chemiker Zeitung" by H. Wislicenus, and it was followed by an account from Dr. F. Henrich, of the way in which the balsam is gathered there and the results of an analysis of 208 grammes collected in one day from one tree. Distilled first with steam, then with super-heated steam, three fractions were obtained, and the author gives the physical characters of these. He isolated pinene from the first two fractions, and has reason to believe that the volatile part also contains one or more esters. From the non-volatile yellowish resin a substance supposed to be identical with abietinic acid was obtained, and Henrich supposes that the volatile matter also contains dipentene and sylvestrene.—Pract. Drug., Feb., 1917, 35.

Plectanthus Inflexus.—*A Constituent of.*—S. Ueno steeped 500 grammes of the air-dried grass with 4 liters of cold 90 per cent. alcohol for a week. After filtration and distillation the residue consisted of dark green crystals, which after removal of chlorophyll and other impurities and after recrystallization from alcohol left white crystals melting at 280° to 285° . The yield was 0.5 per cent. The crystals had a bitter taste and cinnamon odor, contained no nitrogen and did not reduce Fehling's solution after hydrolysis.—J. Pharm. Soc. Japan, 1917, 1085; through Chem. Abstracts (1918).

Plums.—*Conservation of.*—J. V. Eyre and S. T. Parkinson save large plums by drying and a surplus may in this manner be kept for a long time. The drying may be accomplished in a vacuum apparatus, or by subjecting the fruit to treatment with hot air, the former requiring about 18 hours and the latter about 25 hours. Steaming, exposure to chloroform vapor or pricking is sometimes resorted to prior to drying in order to lessen the time required to accomplish this. Subsequent treatment, however, is then required to improve the texture of the fruit. It is stated that the best results are obtained by subjecting the fruit to chloroform vapor, then drying thoroughly, and subsequently heating in a closed vessel for several hours with a limited supply of steam. The practice of treating the fruit with a 1 per cent. solution of sodium carbonate prior to drying possesses no great advantage.—J. Bd. Agr.; through C. U. C. P. Al. J., 24 (1917), 16. (G. C. D.)

Plum Kernels.—*Utilization of.*—Plum kernels are now being collected in Germany and Austria. F. Dervas finds they yield by expression 20 per cent. of a clear, golden-yellow, fixed oil of specific gravity 0.9169 to 0.918, acid value 1.8 to 2.1, and iodine value 97.5 to 100.6. 5 mls shaken with 5 mls of 50 per cent. nitric acid is colored reddish brown. The marc after expression of the oil yields 1.3 to 1.4 per cent. of benzaldehyde-cyanhydrin. The fixed oil is to be regarded as intermediate between almond oil and sesame oil, and suitable for culinary and medicinal use, and the marc, after distillation, can be employed as cattle food.—Apoth. Ztg.; through Pharm. J., 98 (1917), 353.

Primroses.—*Poisonous.*—It may be well for those unaccustomed to country vegetation, including the city-bred youths who will receive their war training in rural districts, that not all of it is as

innocent as its beauty suggests. Many primroses cause serious cases of dermatitis, which have even been known to result in death.

The *Primula sinensis* and the *Primula obconica* are especially toxic. The symptoms resemble those of erysipelas, and may be summed up as follows: slight redness of the skin and eruption of small vesicles on face and neck. These dermatites, which sometimes resemble eczema, are caused by the contact with the skin of the tricellular hairs with which the under side of the primrose leaves are covered. The last of the three cells secretes a product which on being evaporated gives crystals of a brilliant yellow. The characteristic dermatitis can be produced by these crystals. The treatment is the same as applied to similar eruptions. Various other plants seek to protect themselves in a similar way, including *Rhus toxicodendron*, the *Euphorbias*, the *Hellebores* and *Thapsia*, etc.—Larousse Mensual; through Sc. Am. Suppl. No. 2165, June 30, 1917, 411. (O. R.)

Pyrethrum.—*Identification of.*—For identifying pyrethrum in insect powders Gaillard recommends treating the sample with pure sulphuric acid by which a brown color is produced which gradually changes to dark red. By the usual assay methods traces of an alkaloid can be extracted from the drug, which gives a reaction with sulphuric acid similar to that of veratrine, a yellow solution gradually changing to a permanent cherry-red.—L'Union pharm.; through Drug. Circ., 61 (1917), 116.

Quebracho Extract.—*Production in South America.*—Manufacturers of quebracho extract in Argentine and Paraguay have entered into an agreement to limit to a very considerable extent, the output of this product. Early in 1916, as a result of the war, the price rose to 230 pesos gold per metric ton. As a result of this all extract factories began to increase their output, new factories also being operated. This high price resulted in substitutes being employed, more especially oak and chestnut extracts, with the further result that the price of quebracho extract dropped to 100 pesos gold per metric ton. In the new agreement it is proposed to limit the output of the factories to the estimated world's consumption. A selling company will be organized, and the extract delivered to it at a uniform price, and the expected profits will be divided pro rata. The combination is formed by six companies in Argentine and four in Paraguay, with a total output of 160,000 metric tons

per annum, and with an estimated capital of nearly 100,000,000 pesos currency. In the year 1914, 80,153 metric tons of quebracho extract were exported from Argentine, in 1915 the exportation rose to 100,213 metric tons, and this figure is expected to be exceeded in 1916. The price of the extract, upon conclusion of the agreement, immediately rose to 150 pesos gold per metric ton. Peso gold = 4s., currency = 1s. 9d.—Board of Trade J.; through C. U. C. P. Al. J., 24 (1917), 86.

Quisqualis Indica.—Y. Deh-vong describes the fruit of *Quisqualis indica*, var. *villosa*, which occurs as capsules 3 to 4.5 Cm. long, having 4 to 9 edges, so that the cross-section is stellate in appearance. The kernel is rich in oil, loses on drying 10.77 per cent. of water and yields 6.66 per cent. of ash. Ether extraction yields 24.71 per cent. of thick, yellow oil having sp. gr. 0.9072 at 20°; congealing point, -2°; acid number, 31; saponification number, 255.92; iodine number, 39. It contained palmitic and oleic acids and a crystalline compound melting at 116°. Alcohol removes from the kernel 12.57 per cent. of extract consisting mainly of sucrose.—J. Pharm Soc. Japan; through Chem. Abstracts, 11 (1917), 2387.

Ragweed Pollen.—*Analysis of.*—After an interesting discussion of the causation of hay fever by pollen, in which is given a bibliography of 17 articles, F. W. Heyl reports the results of analyses of the pollen of *Ambrosia artemisifolia*, collected with unusual care by him. The microscopy of the pollen grain is carefully reported and it was found that it required about 610,000,000 cells to yield 1 gramme of pollen.

Heyl's analysis shows that 42.9 per cent. of the pollen can be extracted with alcohol and that this alcohol extract contained 10.8 per cent. of fat, 0.75 per cent. of lecithin, 1.75 per cent. of material soluble in ether but insoluble in ligroin, 0.4 per cent. of sucrose, 1.6 per cent. of glucose, 17.4 per cent. of resin and a nitrogenous base. The pollen also contained 5.3 per cent. of moisture, 12.2 per cent. of crude fiber, 7.3 per cent. of pentosans, 5.4 per cent. of ash, 2.1 per cent. of dextrin and 24.4 per cent. of protein.

Of this protein 7.5 per cent. could not be extracted, 6.75 per cent. was extracted with dilute alkali and only 5 per cent. was soluble in 10 per cent. saline.

Ophthalmic tests were obtained in sensitized subjects with 0.000001

to 0.000005 gramme of the pollen protein.—J. Am. Chem. Soc., 39 (1917), 1470.

Red Pepper.—F. M. Boyles has analyzed a large number of typical samples of various varieties of capsicum and arrives at the following conclusions; (a) The present standards are sadly in need of revision. (b) The standard for total ash should be increased to 7.5 per cent. (c) The standard for ash soluble in hydrochloric acid should be increased to 1.0 per cent. (d) The standard for non-volatile ether extract should be reduced to 14.0 per cent. (e) The allowable crude fiber should be increased to 29 per cent.—J. Ind. Eng. Chem., 9 (1917), 301. (G. D. B.)

Red Saunders.—*Scarcity in India.*—Owing chiefly to destructive and wasteful methods of collection, the red saunders tree has become almost exterminated. In the Bombay Presidency it was customary to pull up trees by the roots when they were three years old; the roots were then cut off, and dried in the sun. It is now decided to encourage the growth, and protect the existing stock of sound trees; and work is, therefore, confined within the limits of the red saunders belt or zone, namely, between 800 ft. and 2,400 ft. above the sea level. Beside the ordinary uses for dyeing and coloring purposes, the wood is in demand by builders, because white ants will not attack it. For the *poojahs* (prayers, or purification rites) of Hindus, a paste made by grinding the powdered wood with water is smeared on the forehead of the worshipper, and of the god or goddess. Natives of India use red saunders paste as a local application for sore eyes.—Pharm. J., 99 (1917), 102.

Rhubarb Leaves.—*Dangerous as a Vegetable.*—It has been stated on good authority that rhubarb leaves were used as a pot-herb in Queen Elizabeth's time, and were then "considered to be superior to spinach or beet," but this is poor comfort to those who have recently suffered the tortures of poisoning arising as a consequence of eating them. That numerous cases of more or less serious illness, and at least one fatality, have already followed the eating of the leaves is accepted as a fact, which should leave no doubt in one's mind that they form to many people an unwholesome and even a dangerous food. The rhubarb used for culinary purposes today appears to have originated from more than one species. Some writers attribute its origin to *Rheum rhaponticum*, and there

seems no reason to doubt that it was this species that was first used in this country for culinary purposes, as well as being the first grown in England for its medicinal root. Moreover, it was the first species introduced into cultivation here, and from early times has been known as English rhubarb.—Nature; through Pharm J., 98 (1917), 458.

Rheum Rhaponticum.—*History.*—In connection with a number of items in the English press as to the poisonous character of the leaves of garden rhubarb, William Kirkby discusses references to the introduction of this plant and the use of its leaf-stalks in the making of tarts and pies. His search of the literature reveals that the earliest reference to its use as an edible is in Erasmus Darwin's "Phytologia," which was published in 1800.—Pharm. J., 98 (1917), 497.

Rhubarb.—*Secretions in the Chinese Rhizome.*—Tunmann observed in a rhizome of Chinese rhubarb imbedded in the normal tissue 2 large tumorlike deposits or growths, one inside the other, each separated completely from the normal tissue by cork tissue. These deposits which have been found also in some other rhizomes of rhubarb consist of complex tissues. The parenchyma usually containing the starch is empty and compressed; starch and sugar, uncombined as well as glucosidal, are practically absent. The oxalate cells, however, appear to be abnormally numerous and to contain more oxalate groups than usual. Catechol, gallic acid and the hydroxymethyl anthraquinones were found in undiminished quantity. Recognizable nitro-compounds of these quinone derivatives are obtained by warming a section of the abnormal growth with pure nitric acid on a microscope slide.—Ber. Deutsch. Ges., 35 (1917), 191; through J. Chem. Soc. Abs. (A. V.)

Rhubarb.—*Oxalic Acid Content of.*—L. van Itallie and H. J. Lemkes report that the use of rhubarb which on account of the scarcity of food in Germany and Holland has been recommended for feeding purposes is not at all harmless on account of the rather large percentage of oxalic acid and oxalates in the plant. The leaves of a sample of *Rheum officinale* contained 0.75 per cent. of the acid, while the leaves of a sample of *Rheum leucorrhizum* contained 1.11 per cent. and the stems of the same plant 0.99 per cent. The various varieties of rhubarb were extracted with water,

with 5 per cent. hydrochloric acid and with 5 per cent. sodium bicarbonate solution (the latter being generally used in cooking recipes) and the following results were obtained:

		Decoction	Decoction	Decoction
		Aqueous	with hydro-	with sodium
		decoction.	chloric acid.	bicarbonate.
Rheum rhaponticum.....	leaves	0.14	0.3	0.39
	stems	0.14	0.44	0.33
Rheum emodi.....	leaves	0.28	0.65	0.53
	stems	0.53	0.81	0.82
Rheum palmatum.....	leaves	0.22	0.76	0.52
	stems	0.28	0.57	0.47
Rheum officinale.....	leaves	0.36	0.77	0.62
	stems	0.29	0.46	0.44
Rheum ribes.....	leaves	0.22	0.63	0.52
	stems	0.26	0.54	0.59
Rheum leucorrhizum.....	leaves	0.36	1.11	0.90
	stems	0.45	0.99	0.98

The poisonous dose of oxalic acid is generally given to vary from 2 to 5 grammes but the authors believe that this dose is entirely too high. At least one case of poisoning by the use of rhubarb has been reported.—Pharm. Weekblad, 5 (1917), 1234. (H. E.)

Robinia Pseudoacacia.—*Constituents of the Seeds of.*—Analyses of the air-dried seeds of locust made by L. H. van Berk showed the following constituents: Water 13 per cent., fat 8.5 per cent., albumen 38 per cent., soluble carbohydrates 18 per cent. The average percentage of these constituents in legumes is water 13 per cent., fat 2 per cent., albumin 24 per cent., and soluble carbohydrates 54 per cent. Since the seeds when fed to white mice did not produce any bad effects on the animals, the author believes that the seeds, which in regard to their chemical constituents resemble sesame seeds, may be used for feeding purposes in general.—Pharm. Weekblad, 54 (1917), 1278. (H. E.)

Roses.—*Coloring Blue.*—Cut roses may be colored blue by immersing the stems in a solution of 2 grammes of potassium nitrate and 2 grammes of blue aniline dye in 100 mls of water.—Chem. and Drug., 89 (1917). (K. S. B.)

Rosin.—*Production in Germany.*—Between one and one and a half million of trees were tapped in the Bavarian State woods last spring to provide rosin to replace that formerly imported. Only

sufficient to cover the most urgent demands was obtained, at a cost of about 10 times that of peace times. It was necessary to resort to the use of spruce as well as pine, although the yield from spruce is less.—Chem. and Drug., 89 (1917), 763. (K. S. B.)

Rubber.—*Determination of Mineral Matter in.*—J. P. Peregrin after showing that the results of incineration are not reliable, because of the possible loss of zinc, antimony, lead and other compounds, recommends the following: 1 to 2 grammes of the rubber, in shavings, are digested with from 50 to 100 grammes of anisol, for a period of six hours, at 100° C., or until the rubber mass ceases to swell. The mixture is then treated with a large excess of pure benzol and allowed to stand for a number of days. The mineral matter may then be separated by the centrifugal method.—Am. Chim. Anal.; through C. U. C. P. Al. J., 24 (1917), 129.

Rubber.—*Production from Carbide.*—In Germany, calcium carbide is being produced by a number of electro-chemical plants for the purpose of obtaining rubber indirectly from it. The carbide yields acetylene. This can be converted into acetic acid and acetone and from the latter, rubber is now being synthesized upon a commercial scale.—J. Ind. Eng. Chem., 9 (1917), 984.

Rubber.—*Effect of Copper on.*—The work of previous investigators of the destruction of rubber by copper and copper salts is reviewed by C. P. Fox, and further data given, based on experiments with copper acetate solution alone in the presence of acetic acid and of ammonia water; lubricating oil with rancid vegetable oil and copper acetate; and the oil mixture without the copper. The neutral and acid solutions of copper acetate produced tackiness, the ammoniacal solution caused the rubber to take on a hard surface and crack easily, while the copper containing oil exerted a marked solvent action. In all cases studied, the destruction of the rubber is favored by the presence of copper.—J. Ind. Eng. Chem., 9 (1917), 1092. (G. D. B.)

Rumex Pulcher.—*Constituents of.*—E. J. Emmanuel, after outlining the history of emodin-bearing drugs and describing 25 species of Rumex growing in Greece, reports on the chemistry of Rumex pulcher. From it he obtained pulcheremodin, $C_{15}H_{10}O_5$, orange needles melting at 251°, and forming triacetylpulcheremodin; pulcher-

inic acid, $C_{19}H_{18}O_4$, pale yellow crystals, melting at 168–169°, chrysophanic acid, tannin, 0.285 per cent. of iron, fat, etc.—Schweiz. Apoth. Ztg., 55 (1917), 589, 601, 618 and 626; through Chem. Abstracts (1918).

Rumex Hymenosepalum.—*Source of Tannin.*—The tubers of this plant contains up to 30 per cent. tannin. It has been grown successfully in Corsica and southern France and will also endure the climate of northern France. It is recommended as a source of tannin in place of oaks and chestnuts, which are plants of slow growth and which explains the widespread deforestation in France.—Compt. Rend.; through Sc. Am. Sept. 5, 1917, 187. (O. R.)

Sabadilla.—*Source of Poison Gas.*—The highly poisonous seeds have long been used in medicine for the production of cevadine or veratric acid and of sabadalline, a heart stimulant. The powdered seeds are largely used as a vermicide. The dust from the seed in the field is so irritating to the eyes that the native laborers are obliged to wear masks. Dr. J. N. Rose, Associate Curator of Plants in the Smithsonian Institute in a trip through Venezuela, found that the Germans bought up the entire available supply of the seeds before the declaration of war and are using them in the production of the asphyxiating and tear-producing war gases.—Sc. Am., Aug. 11, 1917, 103. (O. R.)

Sandalwood.—*Production and Exports.*—L. Memminger, United States consul at Madras, India, gives figures showing the amount of sandalwood exported from the Madras Presidency during the past few years. The disposal of sandalwood in Mysore State is a governmental monopoly, and is an important source of profit to the State, the collapse of the market due to war conditions, has led to the erection of a State factory for the distillation of the oil. The article states that *Santalum album* has been found to be parasitic in the later stages of its growth, hence the failure to successfully cultivate the tree, which has to be sought out in very open forests, in hedgerows and along the borders of civilization.—Pharm. Era, 50 (1917), 312.

Santonica.—*Santonin-free.*—E. I. van Itallie and W. F. Woutman report on several lots of Levant wormseed which were

devoid of santonin. The drug was assayed by the Katz-Fromme method.—Pharm. Weekblad, 54 (1917), 304. (H. E.)

Sarsaparilla.—*Honduras Export to the United States.*—During 1916 the Honduras exports of sarsaparilla to the United States were 35,430 lbs., against 16,023 lbs. in 1915.—Chem. and Drug., 89 (1917), 431. (K. S. B.)

Saw Palmetto.—*As Brandy Improver.*—Griebel and Barnes state that the fruit of the saw palmetto, *Serenoa serrulata*, is one of the so-called "bonificateurs" used to improve the flavor of brandy. It contains over 26 per cent. of fat with the very high acid value of 201.4. This fat is soluble in alcohol, and contains 75 per cent. of free fatty acids, chiefly caproic, caprylic, and capric acids. In addition to these, an ester-forming enzyme is present, which is capable of producing esters of alcohols from the fatty acids. The value of the fruit as a "bonificateur" depends, therefore, on the simultaneous presence of these two constituents. It is known that oil of cognac contains considerable quantities of ethyl caprate and allied esters. Doubtless the formation of these esters in a poor brandy would improve the bouquet under certain conditions. The use of the fruit is considered to be objectionable, since it enables a fictitious value to be attached to a low-grade product.—Z. Nahr. Genussmitt.; through Pharm. J., 99 (1917), 154.

Sea-Weeds.—*Iodine Content of Swedish.*—M. Weibull determined the iodine in various kinds of Scandinavian sea-weeds by rapidly incinerating 1 to 2 grammes of the air-dried plants if necessary with the addition of sodium carbonate in order to avoid a loss of the halogen, dissolving the ash in water, filtering, acidulating the filtrate with sulphuric acid and after the addition of 5 mls of chloroform titrating the liquid with N/100 potassium permanganate solution until the aqueous liquid after shaking the mixture well has assumed a pink color. As a blank, potassium iodide solutions of known strength are titrated in a similar way. Thus the author obtained the following percentages of iodine: *Laminaria* 0–0.05 per cent., *Fucus serratus* 0.02–0.2 per cent., *Fucus vesiculosus* 0.0–0.12 per cent., *Halidrys* 0.08 per cent., and *Furcellaria* 0.06 per cent.—Farm. Revy; through Pharm. Weekblad, 54 (1917), 1426 (H. E.)

Senna.—*Adulteration.*—Examination of recent senna importations at New York revealed considerable adulteration with *Tephrosia apollinea*, which contains a toxic glucoside, tephrosin.—Chem. and Drug., 89 (1917), 385. (K. S. B.)

Senna.—*Alexandrian.*—A. Joenssen finds that the broken leaflets of "Arabian" senna (*Cassia angustifolia*) and "dog" senna (*C. obovata*) have recently been used to adulterate commercial "Alexandrian" senna. Analyses for (a) alcoholic extract, (b) aqueous extract, and (c) free, (d) combined, and (e) total hydroxymethylantraquinones gave the following: Alexandrian whole leaf (a) 35.50 per cent., (b) 48.98 per cent., (c) 0.219 per cent., (d) 2.390 per cent., (e) 2.609 per cent.; Alexandrian siftings (a) 25.50 per cent., (b) 48.39 per cent., (c) 0.533 per cent., (d) 2.385 per cent., (e) 2.918 per cent.; cultivated in Sudan by J., whole leaf (a) 21.6 per cent., (b) 44.3 per cent., (c) 0.155 per cent., (d) 3.85 per cent., (e) 4.005 per cent.; ditto, siftings (a) 20.5 per cent., (b) 42.7 per cent., (c) 0.155 per cent., (d) 3.79 per cent., (e) 3.945 per cent.; dog senna (a) 23.7 per cent., (b) 37.6 per cent., (c) 0.125 per cent., (d) 3.69 per cent., (e) 3.815 per cent.; Arabian good grade (a) 26.49 per cent., (b) 42.77 per cent., (c) 0.374 per cent., (d) 2.018 per cent., (e) 2.392 per cent.—Chem. and Drug., 89 (1917), 47.

Senna Beans.—An analysis of senna beans showed considerable proteid (probably legumin) and some sugar but nothing whatever of medicinal value.—W. L. Scoville, J. Am. Pharm. Assoc., 6 (1917), 797. (Z. M. C.)

Senna.—*Bornträger's Test for.*—Casparis reports that "Folia sennæ Palthe," a substitute appearing in Austria, is derived from *Cassia auriculata*. A similar substitute appearing in Switzerland and devoid of activity, is probably identical with it. However, it apparently shows the Bornträger color test more intensely than genuine senna, possibly due to its greater tannin content. The presence of tannin in senna renders the test less sharp, owing to aqueous ether being employed as a solvent. Casparis recommends replacing ether by benzene, which excludes tannin (already suggested by Tschirch, 1898). Boil 0.5 gramme senna leaves with 10 mls 10 per cent. alcoholic potassium hydroxide for 2 minutes, add 10 mls H_2O , filter, add hydrochloric acid, shake out with benzene and the latter with ammonium hydroxide; obtain a

yellow-red color.—Schweiz. Apoth. Ztg.; through Chem. Abstracts, 11, (1917), 2020.

Senna.—*Cultivation of Tinnevely.*—This species grew originally in Arabia, and knowledge of the medical properties of its dried leaf was introduced into both Indian and European pharmacy by the Arabs. They held a monopoly of this drug only so long as they could market it in a pure state. When they commenced adulterating it with useless leaves of other plants their trade was lost. India and Egypt then became the most important centers of supply. Watts reports that the purity, the high quality, and low price of Tinnevely senna placed it in the front rank on the world's purchasing markets. This was only ten years ago, yet in 1914, previous to the outbreak of the great European war, senna cultivation in Tinnevely had been almost entirely discontinued.

What is the explanation of this sudden fall in the area under senna? The truth is that Indian senna has suffered the same fate as Arabian senna. Indiscriminate adulteration has made the purchase of this senna unprofitable for European markets at any price.

Immediately after the war broke out there was an abnormal demand for various drugs to supply the military medical stores. Among these drugs was senna. The price of dried senna leaf rose rapidly from a few annas per tulam of twenty pounds of dried leaf to eight rupees (\$2.60) a tulam of twenty pounds of dried leaf to eight rupees (\$2.60) a tulam. Many ryots who took early advantage of this rise have made small fortunes. Once more the middleman was tempted to add useless leaves of other plants to the pure senna leaf so as to increase the gross weight. He increased his temporary profits in proportion.

The result is that the price offered for Tinnevely senna has once more fallen to such an extent that its cultivation is no longer profitable. Instead of getting eight rupees per tulam the ryot now gets eight annas (\$0.16) only. The Tinnevely ryot had anticipated high prices for senna for the duration of the war. Had the product been exported in a pure state it is highly probable that substantial profits could still be made; as it is, a considerable acreage is being uprooted owing to the low price the leaf commands.—Madras Agr. Col.; through Am. Drug., 65 (1917), 405.

South African Gum.—*Composition and Suggested Uses.*—A sample of typical South African gum, probably derived from the

"white thorn" (*Acacia horrida*) was recently examined at the Imperial Institute. It consisted of small, clear, transparent fragments, with a few larger masses varying from nearly colorless to reddish brown. A few leaf and twig fragments were present. The gum consisted of moisture 14.5 per cent., ash 2.9 per cent., and water-insoluble material 2 per cent. The acid number was 3.9 and the relative viscosity of a 10 per cent. solution at 22° C. was 8.0. It yields a mucilage having good adhesive properties, and is recommended for use in adhesives, pharmaceuticals, confectioneries, etc.—*Chem. and Drug.*, 89 (1917), 765. (K. S. B.)

Soap Weed.—*Collection in Kansas.*—An unexpected source of income has been found by residents of Western Kansas in the harvesting of Spanish bayonet or soap weed. This is not the familiar *Quillaia saponaria* with which the pharmacist is familiar, but is similar to that plant in its constituents and uses.

Eight dollars a ton is the ordinary price paid for the plants in bulk at the shipping point, while the estimated cost of cutting, baling and hauling is \$5 to \$6, depending upon the distance to the railroad. As a man can ordinarily get out a ton a day, the gathering of the weed enables one to make a fair day's wages at a time when other ranch activities are not pressing. After cutting, the plants are allowed to dry sixty to ninety days and then baled.

This weed has long been used by Indian and Mexican women to make a soapy decoction which they employed to wash their hair.

Soap manufacturers also have known of the qualities of this weed, but the harvesting of it has only recently become commercially important, and the gathering of it has become a staple industry on lands adjacent to the Kansas national forest. The plant is common throughout Southern Colorado, Arizona, New Mexico and Texas.—*Drug. Circ.*, 61 (1917), 42.

Solandra Longifolia.—*Active Principle of.*—According to E. N. Ward, the leaves of this plant contain *solandrine*, which has therapeutic action similar to atropine.—*Agr. Gaz.*, N. S. Wales; through *Chem. Abstracts*, 11 (1917), 3380.

Soya Bean and Derivatives.—An unsigned article describes the soya bean and mentions three varieties as being recognized in the market. It is employed as a food product in many forms in the Far East. By hydraulic pressure the beans are made to yield 11

to 12 per cent. of oil, but with benzin and chemical processes as much as 17 per cent. may be obtained. The use of the oil is varied, it is employed as an illuminant, lubricant, for culinary purposes and in the manufacture of soap. It is also used in the making of water-proof cloth, paper umbrellas and lanterns and in the manufacture of varnish and printing ink.—*Nat. Drug.*, 47 (1917), 273. (C. M. S.)

Soya Bean.—*Food Value of.*—Ballard strongly advocates the wider use of the soya bean as a food. Its value has been long known in the Far East. It forms a staple article of diet in the French Indo-Chinese colonies, in Cochin-China, China, and Japan. Soya beans contain 20 per cent. of oil and 40 per cent. of protein, whereas French haricot beans contain only 20 per cent. of protein and 2 per cent. of fat. It is suggested that the soya bean should be cultivated in France. The obvious nutritive value of soya bean meal has already led to its being employed, in some degree, in military rations in the French Army. Its use in this direction, as well as for civilian use, deserves wider application.—*Compt. rend.*; through *Pharm. J.*, 98 (1917), 189.

Soya Bean.—*Poisonous Meal.*—Several years ago a number of cases of poisoning in cattle which had been fed with soya bean meal were reported. Soya beans, after extraction of the oil with a solvent, are reduced to a coarse powder, made into meal or caked and used as a cattle food. The usual solvent used in extracting the oil is naphtha; it was found, however, that trichlorethylene has also been so used. It was also established that the bean itself is not poisonous when fed to cattle, nor the meal or cake prepared from the bean extracted by naphtha. Experiments also showed that the bean when extracted with trichlorethylene and then fed to cattle, caused the latter to become violently and often fatally ill. Pigs and sheep were not so affected. Soya beans are an excellent food for cattle, but must not have been treated with trichlorethylene.—*C. U. C. P. Al. J.*, 24 (1917), 43.

Sphagnum Moss.—*Collection.*—Sphagnum moss, now used extensively to replace cotton in surgical dressings, etc., is best collected by "grubbing" with the hands, followed by drying in open fields, or in wire trays piled under tents.—*Chem. and Drug.*, 89 (1917), 761. (K. S. B.)

Spirogyra.—*Action of Barium on.*—W. J. V. Osterhout finds that the spiral chloroplasts of *Spirogyra* exhibit a peculiar and very characteristic contraction when the alga is placed at 0.0001 M solution of barium chloride. In the middle of the cell the contraction is very marked, while towards the end little or no contraction takes place. The wavy outline of the chloroplast also becomes smooth, but this occurs with other salts. Strontium chloride produces the same effect in stronger solutions (0.001 M), the chlorides of calcium, magnesium, manganese, cadmium, nickel, cobalt, sodium, potassium and ammonium do not. In 0.0001 M dilution the action of barium seems to be specific. The action of trivalent kations was not investigated.—*Am. J. Bot.*; through *Pharm. J.*, 98 (1917), 337.

Squill.—*Biological Standardization of.*—Colson and Engelhardt state that both fluidextract and tincture of squill when prepared from a selected drug very often do not meet the biologic requirements of U. S. P. IX. While the requirements call for the same physiological strength in squill preparations as digitalis preparations, yet the dose given under squill is twice that of digitalis. This suggested that squill was only half the strength of digitalis. This was proven by a number of comparative physiological tests.—*J. Am. Pharm. Assoc.*, 6 (1917), 950. (H. H. S.)

Storax.—*Comparison between American and Oriental.*—S. Jordan points out that sweet gum, which is an American product, being the liquid or semiliquid gum obtained from *Liquidambar styraciflua* is frequently used instead of the genuine liquid storax of the Levant, *L. orientale*. Analysis shows it to contain more cinnamic acid than the commercial storax and that its odor and fixative power are superior to the commercial imported storax. At a price of \$0.50 to \$1.00 per pound it is believed that the southern United States can supply the demand of the entire country. Many samples of the American and Levant gums have been shown to be grossly adulterated with Burgundy pitch, colophony, castor oil and extracted storax.—*J. Ind. Eng. Chem.*, 9 (1917), 770. (G. D. B.)

Stramonium.—*Adulteration of.*—Recent importations of supposed samples of stramonium were found to consist largely of the leaves of *Xanthium strumarium*, which are derived of solanaceous alkaloids. The importation of such sophisticated stramonium is

therefore prohibited.—Service and Regulatory Announcements, U. S. Department of Agriculture; through Am. J. Pharm., 89 (1917), 551.

Strophanthus.—*Difference in Toxicity According to Mode of Administration.*—L. W. Rowe discusses the variation in toxicity of a strophanthus preparation depending on whether it is administered orally, hypodermically or intravenously. He reports a number of comparative experiments along this line conducted by him, and concludes that subcutaneous and intravenous toxicities of the preparations used are 45 to 100 times as great as their oral toxicities; that the satisfactory oral dose is not a true index of the potency of the drug; and that the best therapeutic results are obtained by hypodermic administration of the proper preparation.—Therap. Gaz., 33 (1917), 536.

Sugar Beets.—*Made into Bread.*—According to l'Agriculture Nouvelle successful attempts have been made in France. The beets are boiled, grated and mixed with an equal amount of wheat flour and the proper proportion of salt to form bread dough.—Sc. Am., Sept. 22, 1917, 205. (O. R.)

Sugar Cane.—*Changes after Cutting.*—According to J. H. Barnes, in certain districts of India, it is customary for the farmers to allow the stripped cane to remain in heaps for several days before the crushing is attempted. It is claimed that the juice thus obtained is lighter in color than that obtained from cane crushed immediately after cutting. Investigations have demonstrated the fact that sugar cane thus stored is further ripened, with a consequent increase of the sucrose content. It must, however, be remembered that storing beyond a limited time, depending somewhat upon the kind of cane, and the temperature, results in inversion and consequent loss of sugar. Chemical changes resulting in an increase of sucrose content are only possible as long as the cell protoplasm is alive and active. When its activity ceases, other chemical changes caused by oxidation and enzymes, takes place, and the quantity of sugar obtained is materially lessened.—Agr. J. India; through C. U. C. P. Al. J., 24 (1917), 164. (G. C. D.)

Taraxacum.—*Adulteration of.*—Due to discovery of 40 per cent. of discolored or improperly dried roots in a recent taraxacum im-

portation, the U. S. Department of Agriculture is expected to recommend that a limit of 10 per cent. of such roots be permitted.—Chem. and Drug., 89 (1917), 852. (K. S. B.)

Tea.—*Detecting Adulteration of.*—L. Rehfpous examines the stomata which are quite different in *Thea sinensis* from those of the leaves used for adulteration. In *Thea* the guard-cells of the stomata possess, on their inner surface, a very strongly marked layer of cutin, which is prolonged into a beak or hook, and which is distinct from the beak which closes the ostiole. Mr. Rehfpous finds these features, with minor variations, in all of numerous kinds of tea examined, and they appear even in the sepals of the tea plant. The only leaf used for adulteration that bears much resemblance to *Thea sinensis* is the leaf of *Camellia* (also a species of *Thea*), but a transverse section of the latter shows that the hooks of the stomata are very slightly developed.—Bull. Bot. Soc. Geneva; through Pract. Drug., Nov. 1917, 38.

Tea.—*Substitutes for.*—The dried leaves of strawberry, blackberry, red currant, raspberry, cherry, birch, elm, willow, blackthorn and walnut are suggested as substitutes for tea during the present shortage in Germany.—Chem. and Drug., 89 (1917), 689. (K. S. B.)

Thyme.—*Use as Veterinary Remedy.*—A handful of thyme herb cut in with the food and given every other morning for three weeks is recommended as a substitute for thymol as a remedy for strongylus tetracanthus in horses.—Chem. and Drug., 89 (1917), 911. (K. S. B.)

Tobacco.—*Alkaloids of.*—If Turkish tobacco waste is exhausted with water and the liquid concentrated in a vacuum, a residue is obtained containing, in addition to small quantities of alkaloids not volatile in steam, nicotine and isonicotine, $C_{10}H_{12}N_2$, which forms a viscous liquid with a strong persistent odor, optically inactive, boiling point 293° , specific gravity 1.0984.—Schweiz. Apoth. Ztg.; through Pharm. J., 99 (1917), 111.

Tobacco.—*Fire-Holding Capacity of.*—H. R. Craybill points out that this phrase refers to the length of time the leaf or cigar will continue to glow after ignition. A cigar tobacco must have primarily a good fire-holding capacity, and for this reason this has been

the main criterion in judging the burn of cigar tobacco. Experiments with various artificial manures have shown that the alkali carbonates of caesium, rubidium, and potassium have a marked effect in promoting the fire-holding capacity. The relative efficiency of these salts is in the order given. Sodium and lithium carbonates have no effect. Potassium oxalate and citrate are the only oxalate and citrate of those tried which are effective. Many organic salts of potassium, K_2CO_3 , K_3PO_4 , K_2HPO_4 , and K_2SO_4 , improve the fire-holding capacity, while KCl , $KHSO_4$, and KH_2PO_4 are injurious. Na_2CO_3 is beneficial, while all other sodium salts are either neutral or injurious in their effect. It is suggested that the beneficial salts have a specific catalytic action in the combustion and that the chlorides have a negative catalytic action.—Bot. Gaz.; through Pharm. J., 99 (1917), 270.

Tobacco.—*Nicotine Assay of.*—Tingle and Ferguson suggest the following method: 20 grammes of tobacco, 40 grammes of barium hydroxide and 150 mls of water are placed in a large flask, and subjected to steam distillation. The distillation is continued until the product ceases to react with phenolphthalein, using a 500 ml flask as receiver. After adding 20 mls of sulphuric acid to the distillate, the liquid is reduced to 50 mls by evaporation. Enough solution of potassium hydroxide to render the liquid strongly alkaline is then added, and if necessary for clarification, a few drops of solution of barium hydroxide may be added. The liquid is made up to 100 mls, by addition of distilled water, and set aside until the precipitate has fully subsided. The supernatant liquid is removed by filtration, and its rotation determined by use of the polarimeter. A modification of the method in which chloroform is employed to extract the nicotine from the steam distillate is also described. Both methods gave approximately the same results, which in each case were higher than those obtained by the Toth or Kissling methods, when applied to the same specimen of tobacco.—Trans. Roy. Soc. Canada; through C. U. C. P. Al. J., 24 (1917), 62. (G. C. D.)

Tobacco Smoke.—*Action on the Isolated Heart.*—Clerc and Pezzi subjected 5 to 10 grammes of various kinds of tobacco to slow combustion and the smoke passed through Ringer's solution. After making up to two liters and filtering, these solutions were used to perfuse the isolated rabbit's heart. The smoke of ordinary

tobacco gave the characteristic stimulant reactions of nicotine; but, in addition, a marked depressant action which arrested the pulsation in diastole. Smoke solutions from denicotinized tobacco gave no nicotine reaction, but showed even more pronounced depressant action. The stimulant effect of nicotine in ordinary tobacco masks the depressant action, and retards final cardiac arrest. This depressant property is not peculiar to tobacco smoke, but is common to the products of combustion of many plants; it was observed with a solution of the smoke of dried oak leaves.—*Compt. rend. biol.*; through *Pharm. J.*, 98 (1917), 439.

Tobacco Substitutes.—*Effect upon the Teeth.*—Dentists in Germany and Austria are finding that some tobacco substitutes are causing inflammation of the gums and loosening of the teeth. Rose leaves and strawberry leaves appear to be harmless, but bramble leaves are under suspicion.—*Chem. and Drug.*, 89 (1917), 976. (K. S. B.)

Tomato Plants.—*As Phylloxera Destroyers.*—Crouzel states that an Italian vine-grower, having planted tomatoes between the rows of vines in a vineyard badly infested with phylloxera, was gratified to note fresh, healthy shoots break forth from the withered stocks, while numbers of dead phylloxera insects were found around the roots of the tomato plants. The author discusses this discovery, which, if verified by experience, is one of the greatest importance. The action is attributed to the excretion of solanine or one of its derivatives, by the tomato roots. It is noted that the skins of tomatoes contain a considerable amount of that alkaloid. These skins are said to act as an emetic on cats and dogs, although the pulp of the fruit, which is free from solanine, has no such action.—*Rep. Pharm.*; through *Pharm. J.*, 98 (1917), 375.

Unicorn Root.—*Inferior Quality.*—In the Service and Regulatory Announcement of the U. S. Department of Agriculture, it is reported that many samples of the root of *Aletris farinosa* contain excessive amounts of total ash and of acid-insoluble ash (sand). While the National Formulary permits the presence of 16 per cent. of ash, many samples exceeded this amount. The officials feel that when properly collected not more than 10 per cent. of total ash will be obtained. One sample examined by the Depart-

ment contained three per cent. of true unicorn root; the rest being the root of *Chamælorium luteum*.—Am. J. Pharm., 89 (1917), 605.

Uzara Root.—*Constituents of.*—W. Hennig discusses this root, which is used as an anti-diarrhetic, and its dried alcohol extract, which is sold under the name "uzaron." From the latter, Hennig has isolated 2 glucosides (having different physiological effects) one of which is amorphous and present in very small amounts, while the other, *uzarin*, $C_{75}H_{108}O_{30} \cdot 9H_2O$, forms colorless needles melting about 210° (decomposing about 200°). On hydrolysis, uzarin yields propyl alcohol, dextrose and uzaridin, $C_{18}H_{24}O_5 \cdot \frac{1}{2}H_2O$, colorless leaflets decomposing about 246° (anhydrous), the last substance being partly changed to anhydrouzaridin, $C_{18}H_{22}O_4 \cdot \frac{1}{2}H_2O$, needles decomposing about $208-14^\circ$ (anhydrous). Uzaridin forms a triacyl derivative, needles melting at $225-7^\circ$.—Arch. Pharm., 255 (1917), 382; through Chem. Abstracts (1918).

Valerian.—*Evaluation of.*—T. Ryden determined the valeric acid by saponifying the powdered drug with 100 mls of half-normal alcoholic potassium hydroxide, acidulating an aliquot part of the filtrate with phosphoric acid, distilling the mixture after dilution with water free from carbon dioxide. The distillate was then titrated with tenth-normal barium hydroxide V. S., each mil equalling 0.0102 gramme of valeric acid. Ryden recommends a requirement of 4 per cent. of volatile acid and not more than 10 per cent. of ash.—Svensk Farm. Tidskrift., 21 (1917), 525; through Chem. Abstracts (1918).

Viburnum Opulus.—*Substitution of Acer Spicata for.*—The Service and Regulatory Announcement of the U. S. Department of Agriculture states that many samples of the cramp bark in the American market are the bark of *Acer spicata*. Directions are given for the detection of this adulterant (see Year Book 1913, 202).—Am J. Pharm., 89 (1917), 605.

Wild Cherry.—*Contamination with Metallic Iron.*—C. H. LaWall had the rather unusual experience of finding particles of metallic iron in some ground wild cherry bark that had been purchased by the Philadelphia College of Pharmacy for the use of students in making the official preparations of wild cherry. A cursory exam-

ination of the drug revealed nothing suspicious but on percolation every one of the percolators became black and the percolate had the appearance of ink. Investigation showed that the ash content was not abnormally high, although the ash showed an abnormally high iron content; this was confirmed by colorimetric tests. On shaking some of the ground bark with water in a flask and allowing to settle a number of black particles were observed, which on examination proved to be metallic iron, clean and free from oxidation. It was possible to remove these with a small horse-shoe magnet; from two different portions of the ground bark it was possible to remove, respectively, 0.025 and 0.028 gramme of unoxidized iron. Prof. LaWall accounts for the presence of this iron by the drug being ground in a mill equipped with iron grinding surface.—Proc. Penna. Pharm. Assoc., 40 (1917), 242. (J. K. T.)

Wild Cherry Bark.—*Effect of Sunshine on the Glucosidal Content.*—Investigators have stated that there is more glucoside in wild cherry bark grown on the north side of the tree than is in the bark grown on the south side of the same tree. C. V. Nichols has studied the question by macerating the bark of three trees with water, distilling the resulting hydrocyanic acid with steam and determining the amount of acid with silver nitrate by the Volhard method.

He found that the "south" bark of tree No. 1 yielded 0.176 per cent. of hydrocyanic acid; that the "north" bark yielded 0.2125 per cent.; that the "south" bark of tree No. 2 yielded 0.1806 per cent.; that the "north" bark yielded 0.2188 per cent.; that the "south" bark of tree No. 3 yielded 0.1682 per cent.; and that the "north" bark yielded 0.189 per cent.—J. Am. Pharm. Assoc., 6 (1917), 540.

Xanthoxylum Species.—*New Active Principles.*—In 1901 H. Bocquillon recorded the occurrence of crystalline neutral principles, in small amount, in different members of the genus *Xanthoxylum*. Other investigators have also found similar constituents. A larger supply of material has enabled the investigation to be carried further. It has been established that these substances are lactones. From *X. caribœum* petroleum ether extracts the lactone, carixanthide, $C_{12}H_{24}O$, in white needles, soluble in water, melting at $285^{\circ}C$. From *X. carolianum* the same solvent extracts another lactone, carolixanthide, $C_{20}H_{19}O_6$, forming needles, insoluble in water, which melt at $119^{\circ}C$. It dissolves in carbon bisul-

phide, and in chloroform, as well as in petroleum ether. From *X. americanum* Witte has obtained by extraction with ether a neutral substance, xanthoxylin, $C_{14}H_{14}O_4$, in anhydrous white prisms, insoluble in water, soluble in organic solvents, melting at $131^{\circ}C$. From the bark of *X. senegalense*, Giacosa and Soave have isolated by means of petroleum ether extraction a lactone, $C_{13}H_{10}O_3$, forming white, tabular prisms, insoluble in water. The fruit of the same species has been found by Streglitz to contain the same substance to which he attributes the formula $C_{12}H_8O_4$, and has named it xanthotoxin. The author confirms the occurrence in the seeds of *X. piperitum* of the crystalline substance, melting at $80^{\circ}C$, isolated many years ago by Stenhouse. The presence of α -xanthoxylin, in brilliant, colorless plates, melting at $162^{\circ}C$., and β -xanthoxylin, melting at $187^{\circ}C$., in the seeds of *X. octroxylum*, as recorded by Leprince, is also confirmed. All these substances are accompanied by fixed or volatile oils.—Rep. Pharm.; through Pharm. J., 98 (1917), 275.

Yacca Gum.—*Uses.*—Yacca gum, collected principally in the Kangaroo Islands, has been used in the manufacture of cheap furniture polish, varnish, lacquer for metal ware, linoleum and as a photographic light filter. Treated with nitric acid it yields 45 per cent. of picric acid, and with caustic soda yields 8 per cent. of para-oxybenzoic acid. The large German purchases are thought to have been used to make explosives.—Chem. and Drug., 89 (1917), No. 1969, Supp. XXXIX. (K. S. B.)

Yeast.—*Enzymes of.*—T. Bokorny states that brewers' yeast, after having been in contact with absolute alcohol for a period of several days, has apparently lost none, or but very little, of its inverting power, after removal from contact with the alcohol. The invertase of yeast is also relatively insensitive to contact with acids. It is, however, destroyed in 24 hours by action of 1 per cent. potassium or sodium hydroxide solution, but not by a 5 per cent. formaldehyde solution. Maltase has its action seriously interfered with by contact with alcohol, even of 10 per cent. strength, or with 1 per cent. acetic, lactic or hydrochloric acids, for 24 hours. Contact with 1 per cent. solution of sodium hydroxide destroys it in a few hours, but is very little affected by contact with 0.02 or 0.10 per cent. solutions. Formaldehyde, in weak solution (0.1 per cent.), acts injuriously. The action of zymase is much lessened

by contact with solutions of neutral salts, in 10 per cent. or higher concentrations. Weaker solutions are generally harmless, or in some instances even seem to enhance its action. The activity of zymase is destroyed by contact with 50 per cent. alcohol, for 24 hours, 20 per cent. alcohol, however, does not affect it. Its action is likewise much diminished by 0.50 per cent. sulphuric or hydrochloric acids for 24 hours. Contact with 5 per cent. solutions of lactic, acetic, and butyric acids destroys its activity within 2 hours. Two per cent. concentrations of these acids, however, are not effective. One per cent. solutions of formaldehyde, or 0.05 per cent. solutions of ammonia, destroy the activity of zymase in from 24 to 48 hours.—*Allg. Brau. u. Hopf. Ztg.*; through *C. U. C. P. Al. J.*, 24 (1917), 44. (G. C. D.)

Yeast.—*In Diseases of the Skin and Gastrointestinal Tract.*—Philip B. Hawk and co-workers report clinical trials which appear to show that the internal administration of baker's yeast is of value in the treatment of furunculosis, acne vulgaris, acne rosacea and certain other cutaneous and gastrointestinal conditions. It is reported that in most instances yeast had a laxative effect and that killed yeast acted much like living yeast.—*J. Am. Med. Assoc.*, 69 (1917), 1243. (W. A. P.)

Yucca Filamentosa.—*Saponin of.*—Chernoff, Viehovever and Johns obtained from the rootstocks of *Yucca filamentosa* a yield of 6 per cent. of a new saponin, having the formula $C_{24}H_{40}O_{14}$. This new saponin is reported to be soluble in water, phenol and glacial acetic acid, and could not be precipitated from aqueous solutions by either lead acetate, lead subacetate or barium chloride solutions. Hemolysis was noted, after 15 minutes, in a 1 in 20,000 solution of the saponin to which rabbits' blood had been added, and which had been kept at a temperature of $37^{\circ}C$. Dextrose and a crystalline sapogenin, melting at $175^{\circ}C$. were obtained upon hydrolysis. Glycuronic acid also appeared to have been formed. In the plant, the saponin is seen as brownish amorphous masses in the fibro-vascular bundles of the roots and leaf bases.—*J. Biol. Chem.*; through *C. U. C. P. Al. J.*, 24 (1917), 86. (G. C. D.)

Yuca Starch.—Starch is made in Santa Domingo by the peasants throughout the Cibao region from the yuca or manioc root of

Jatropha manihot, by squeezing out the juice and then drying it.—*Sc. Am.*, Aug. 25, 1917, 147. (O. R.)

C.—ANIMAL DRUGS AND PRODUCTS.

Beeswax.—*Difference from Adulterants.*—A. Dubosc finds that a comparison of the free and the combined acids of wax is a valuable factor for determining the purity of wax. Free acids are determined by treating with a known excess of normal alkali and then titrating back with normal acid V. S. Combined acids are determined by saponifying the wax residue from the preceding test with alcoholic potassa as in the official ester number determination. One gramme of pure beeswax takes 20 milligrammes of KOH for free acids and 75 milligrammes for combined acids; carnauba wax takes 4 and 75 milligrammes respectively, while Japan wax takes 20 and 200 milligrammes. Of course, paraffin and ceresin show neither free nor combined acids while stearic acid shows free acid only.

Fabris differentiates between beeswax and its substitutes by the viscosity of their 10 per cent. solutions in nitrobenzene. The viscosity of yellow wax ranges from 15.23 to 16.3; white wax from 16.54 to 17.53; carnauba wax from 42.03 to 43.03; Japan wax from 20.71 to 21.12; paraffin from 3.49 to 6.69.—*Caoutchouc et Gutta Percha*; through *J. pharm. chim.*, 15 (1917), 324.

Beeswax.—*Quality of White.*—F. K. Ehmann, after discussing various adulterants of white wax and tests for their detection, reports that of fifteen samples purchased in Philadelphia, only one sample was found adulterated, it containing white lead.—*J. Am. Pharm. Assoc.*, 6 (1917), 347.

Cantharides.—*Was it "The Fly in the Ointment?"*—A discussion as to what was "the fly in the ointment" mentioned in Ecclesiastes X, 1, gives some interesting historical data. J. S. Palmer directs attention to the fact that the text does not say that either a fly or a legion of them spoil the ointment, but that "dead flies cause the ointment of the apothecary," a specific preparation made from dead flies from time immemorial (*unguentum cantharides*) "to send forth a stinking savour." Mr. Palmer then gave the consulter of the oracle a sniff of the powdered cantharides bottle, which left him in no doubt as to the effluviousness of these particular dead flies.

William Kirby objects to this explanation of the text, stating that as far as he can gather, Aretæus (2nd century A. D.) seems to have been the first to use the drug externally as a rubefacient; but formulæ for a definite official article (other than blistering preparations) are comparatively modern. The most obvious question of all: what becomes of the meaning of the passage of Scripture which is that a little body in the wrong place can destroy so much sweetness, if we adopt Mr. Palmer's notion that the preparation was a stinking compound *per se*?

E. J. Raynor cites from the Douay Version of 1609: "Dying flies spoil the sweetness of the ointment. Wisdom and Glory is more precious than a small and short lived folly." The passage is clearly a metaphor, and in that sense was used by St. Augustine, who, writing *circa* 400 A.D., drew a comparison between the fly in the ointment and a heretic spreading false doctrine among the community. Albertus Magnus and St. Thomas Aquinas, who were not likely to have been unacquainted with Unguentum Cantharidis, appear to have adopted the same interpretation, and the commentary of the great Biblical scholar, Menochio, who was Superior of Milan University during the later years of the sixteenth century, and who brought his vast store of knowledge of Jewish antiquities to bear on his work, expresses a similar opinion. Pharm. J., 99 (1917), 92 and 105.

Cochineal.—*Color Reactions of.*—C. F. Muttelet finds that an aqueous solution of ammoniacal cochineal gives a violet color with ammonia, which is not much modified on adding a slight excess of hydrochloric acid. If this acid solution is shaken out with amyl alcohol, and the solvent is separated, and then shaken with a little aqueous solution of uranium acetate; on separating the watery layer shows a fine amethyst violet color. Under similar conditions, carmine affords an emerald green color. Sometimes, commercial ammoniacal cochineal is met with which still contains some carmine, due to the incomplete transformation of the latter into carminamide. In this case, the amyl alcohol extract is treated with an excess of powdered calcium carbonate. After a few hours' contact, the whole is thrown on a filter, when the liquid passes almost colorless. The precipitate is washed with a little alcohol, then treated with water. The aqueous solution thus obtained will be bright red, leaving the powder on the filter greyish violet. This red aqueous filtrate is acidified with hydrochloric acid, shaken out

with amyl alcohol and tested with uranium acetate, as above. It gives the characteristic violet reaction of ammoniacal cochineal. The above insoluble calcium lake left on the filter is then decomposed with hydrochloric acid; the orange acid solution thus obtained tested in the same way after again shaking out with amyl alcohol, gives the emerald-green color of carmine.—Ann. Falsif.; through Pharm. J., 99 (1917), 123.

Epicauta Ruficeps.—*Cantharidin in.*—C. van Zijp has examined a Javanese beetle, *Epicauta ruficeps*, which is an egg-parasite of a locust *Cyrtacanthracis nigricornis*. The beetle which is also named *Cantharis tenuicollis*, *Cantharis ruficollis* or *Cantharis syriaca* is colored black with the exception of the head, which is red, is 18 to 22 Mm. long, 5.5 to 6.5 Mm. broad and weighs about 75 Mg. It secretes a liquid which is a strong vesicant and which was found to contain cantharidin. The latter could be obtained in the form of plates by subliming the dried beetle in the presence of hydrochloric acid. When treated with barium hydroxide solution the cantharidin was split up into a product which when viewed under crossed Nicol prisms appeared as silver white needles. With ammonia water cantharidin forms a salt which, however, rapidly is converted back into cantharidin.—Pharm. Weekblad, 54 (1917), 295. (H. E.)

Honey.—*Biological Test for Purity of.*—Gadamer and Laske report a study of a number of tests suggested for the detection of invert sugar in natural honey. They find all of the proposed tests are of little value except those using a specific antiserum. Thus the serum obtained by injecting cats with the proteids obtained from honey by dialysis, when introduced into a 10 per cent. solution of pure honey gives a precipitate in considerable quantity. When added to an adulterated honey, little or no precipitation occurs.—Arch. Pharm.; through J. pharm. chim., 17 (1916), 342.

Hypophysis—*Active Principle of.*—Despite the suggestion obtained from certain advertising claims, the active principle of the pituitary gland has not been isolated in a pure state. An examination of commercial preparations showed that proteoses and possibly peptones were present in all.—J. Am. Med. Assoc., 69 (1917), 1431. (W. A. P.)

Hypophysis.—*Active Principle of.*—H. Fuehner does not consider it probable that the active principles of the pituitary body are choline esters, since hypophysin shows very marked difference from these in action. Hypophysin is not antagonized by atropine, which arrests the action of choline esters in very small doses.—*Biochem. Zeit.*; through *Pharm. J.*, 98 (1917), 257.

Lagocephalus Levigatus.—*A Poisonous Fish.*—According to O. O. R. du Fonseca, the smooth puffer, *Lagocephalus levigatus*, is considered by fishermen to be the most poisonous fish of Brazilian seas. It frequents the South-west Atlantic, and is also met with in the Mediterranean, and elsewhere. Poisonous fish occur in the family Spheroides (a sub-family of the Globe fishes). The blood, kidneys, and spleen of *Spheroides testudinens* are not poisonous, but the other organs, the muscles and the skin, are highly toxic. From 0.05 to 0.1 mil of an extract representing 0.01 or 0.02 Gm. of the liver killed guinea pigs in a few minutes. The poison has a paralyzing action on the nervous system.—*Brazil Medico*; through *Pharm. J.*, 99 (1917), 145.

Milk.—*Effect of Adding Lime Water.*—Bosworth and Bowditch finds that milk normally contains some insoluble calcium hydrogen phosphate; when calcium hydroxide is added to milk an increased quantity of insoluble phosphates is precipitated as a mixture of di- and tricalcium phosphates. The reaction of the milk serum becomes nearly neutral, the alkalinity of the calcium hydroxide being neutralized by the formation of these insoluble phosphates. When cow's milk is treated with lime water for infant feeding, and then diluted with an equal volume of water, the amount of soluble calcium and phosphates left in the dilution becomes less than that normally present in human milk, on account of this precipitation as insoluble phosphates.—*J. Biol. Chem.*; through *Pharm. J.*, 98 (1917), 337.

Milk.—*Coagulation in the Stomach.*—J. Brennemann finds that cows' milk curdles in the stomach within a few minutes. The small curds at first formed coalesce and aggregate for about two hours, then decrease from digestion, but are still present after five hours. The curds of raw milk are large and hard; those of boiled milk, soft and small; pasteurized milk gives curds between the two in consistence but more like those of raw milk. Raw milk is a very solid food; boiled milk a semi-liquid one. Milk swallowed

very slowly forms a larger curd than when taken quickly. Alkalies and sodium salts very greatly inhibit coagulation and even stop it completely if present in sufficient amount. Dried or condensed milks form a minimum of curd. Starchy decoctions, such as barley water, have a decided influence in lessening the size of the curd, much more so than simple watery dilution. Soluble carbohydrates such as sucrose, maltose, and lactose have no appreciable effect.—Arch. Pediat.; through Pharm J., 98 (1917), 375.

Milk.—*Assay of Saccharose and Lactose in Condensed.*—Fellenberg gives the following method for estimating saccharose and lactose in condensed milk: Ten grammes of the milk are dissolved in a 500-mil graduated flask, in 100 mils of water, and after the addition of 15 mils of Fehling's solution, 25 mils of normal sodium hydroxide solution and sufficient water to obtain 500 mils, the mixture is filtered. One hundred mils of the filtrate are heated for 6 minutes after the addition of 50 mils of Fehling's solution and the cuprous oxide is collected in the usual way. From the amount of cuprous oxide the amount of lactose is calculated. From the percentage found 0.4 should be subtracted, this excess being due to the presence of saccharose. Fifty mils of the filtrate are heated with one mil of normal hydrochloric acid for one-half hour, the mixture is neutralized with one mil of normal caustic soda solution and diluted with sufficient water to obtain 200 mils. Fifty mils of this solution corresponding to 0.25 gramme of condensed milk are mixed with 50 mils of Fehling's solution and the mixture heated for two minutes. From the amount of cuprous oxide formed the amount of invert sugar is calculated. The amount of lactose found is divided by 1.4, the quotient deducted from the total amount of invert sugar and the remainder multiplied by 0.95. The product gives the amount of saccharose.—Ann. Falsif.; through Drug. Circ., 61 (1917), 20.

Milk.—*Detection of Sugar in.*—In order to bring the specific gravity of watered milk up to the normal, generally sugar is added to the milk. Such an addition can be detected by adding to 10 mils of the milk 10 mils of a reagent prepared by dissolving 20 Gms. of ammonium molybdate and 100 Gms. of hydrochloric acid in sufficient water to obtain 1000 mils and heating the mixture in a water-bath at about 80°. In the presence of sugar, an intense blue color is produced in the mixture. As a control a mixture of 10 mils of

pure milk or 10 mls of 2.6 per cent. lactose solution and 10 mls of the reagent is heated at the same temperature for the same length of time.—*Gaceta farm. Espan.*; through *Pharm. Weekblad*, 54 (1917), 1360. (H. E.)

Milk.—*Freezing Point of.*—The freezing point of cows milk is generally adopted as at 0.54° . G. A. Stutterheim found that the freezing point is liable to vary considerably even with non-watered milk, because milk of under-fed or starved cows is liable to freeze between 0.52 and 0.54° . He therefore claims that an addition of 8 per cent. or less of water to the milk cannot be detected by the freezing method.—*Pharm. Weekblad*, 54 (1917), 458. (H. E.)

Milk Powder.—*Analysis of.*—Porcher claims that the quantity of moisture in milk powders is best determined by drying over phosphorus pentoxide at 45° C. for a period of 48 hours, or in case of necessity for 72 hours. He finds sulphuric acid unsuitable for the purpose, because of its vapor pressure at 45° C. Desiccation over calcium chloride proved to be a very slow process. He also finds the ordinary method of drying in a steam-oven unsuitable, stating that the powder becomes colored brown, no doubt because of a change in some of its constituents. He finds the brown color more pronounced in the case of milk powders which have been made from milk treated with sodium bicarbonate. For the determination of fats, he recommends the Röse-Gottlieb method, stating that extraction with ether in a Soxhlet apparatus gave low results.—*Ann. Falsif.*; through *C. U. C. P. Al. J.*, 24 (1917), 103. (G. C. D.)

Milk.—*Proportion of Sugar to Other Solids.*—E. Ackermann, after a study of many samples of milk, concludes that the amount of sugar in a normal sample is always greater (about 4 per cent.) than the percentage of the solids other than sugar and fat. If the sugar content decreases while the solids other than sugar and fat remain constant, some disease of the udder is to be suspected. In such case it is unusual for the solids other than sugar and fat to be less than 4 per cent. If both sugar and other solids decrease together, watering of the milk is likely.—*Schweiz. Apoth. Ztg.*; through *J. pharm. chim.*, 15 (1917), 166.

Ovarian and Placental Extracts.—*Unreliability of.*—W. H. Morley discusses the unreliability of the reports on and the uncertainty of the extracts of ovarian and placental substances. He believes that a more uniform method of preparing such extracts must be instituted; that such method of standardization is needed; and that many questionable clinical results of these extracts are due to their faulty preparation.—Trans. Am. Gynecol. Soc., 1917, 228.

Pepsin Solutions.—*The Permanence of.*—C. F. Ramsay reports the results of some experiments having to do with the effect of different acids upon the activity of pepsin. The N. F. IV solutions were tested: all were up to standard when fresh but at the end of six months they showed a loss of activity varying from none to total, according to the degree of acidity. The inert specimens were those containing 0.23 per cent. and 0.4 per cent.; those showing no loss were neutral. Likewise, in a series of solutions with free hydrochloric acid ranging from 0.02 per cent. to 0.3 per cent., the deterioration (7 to 60 per cent.) was in direct proportion to the acidity, and a series containing tartaric acid from 0.1 per cent. to 1 per cent. showed a loss of activity ranging from 7 per cent. to 25 per cent.

Alcohol had no effect unless in excess of 30 per cent.; sulphurous acid none, unless in excess of 0.7 per cent.; 50 per cent. of glycerin caused no deterioration.

Mr. Ramsay expects to test these samples again after one year and to carry the study of the effect of acidity still further.—J. Am. Pharm. Assoc., 6 (1917), 1047. (Z. M. C.)

Pidan.—*A Chinese Egg Food.*—Blunt and Wang describe this egg food used by the Chinese and other Oriental nations, which appears to be, like our own cheeses, a product of bacterial change in albuminoids, brought about by prolonged keeping under such conditions as experience has proved to be suitable for the production of a dietetic article. Doubtless a cursory acquaintance with this substance has given rise to those travellers' tales of the preference of the Chinese for "rotten," rather than new-laid eggs. Pidán is made from ducks' eggs by pickling them in an infusion of black tea, lime, salt, and wood ashes, for about six months, very much as we preserve eggs in a solution of sodium silicate. They are then drained and coated with rice husks, when they are ready for the market. The taste of pidán is characteristic, and the odor

strongly ammoniacal, but without any suggestion of sulphuretted hydrogen, such as is found in bad eggs. Chemical investigation shows that water in large quantities is transferred from the white to the yolk. The amount of ash and the alkalinity of the ash are increased, as they are in eggs preserved in alkali. The amount of ether extract is increased, and its acidity is high. The amount of total and lecithin phosphorus is diminished. The non-coagulable nitrogen and the ammoniacal nitrogen are increased, the latter to an extraordinary degree. These changes are probably brought about by the agency of alkali-bacteria and enzymes. It is thus evident that pidan is closely related to cheese in the manner of its production, and, like that comestible, is eaten without cooking.—J. Biol. Chem.; through Pharm. J., 98 (1917), 237.

Pituitary Extract.—*Use in Obstetric Practice.*—L. J. McNeill finds that the very pronounced physiological action of pituitary extract requires that it should be administered with the greatest caution. Although as an extremely active oxytocic, in selected cases, it has no equal, the drug should have no place in normal obstetrics. A number of cases where rupture of the uterus and other ill effects have followed the incautious use of pituitary extract are quoted.—Am. J. Obstet.; through Pharm. J., 98 (1917), 295.

Pituitary Extract.—*Standardization by Use of Beta-iminazolylethylamine Hydrochloride.*—Pittenger and Vanderkleed have been making a study of the standardizing substance and report their conclusions in a paper presented to the Scientific Section of the American Pharmaceutical Association at the Atlantic City meeting. They make the statement that the standard adopted by the U. S. P. is low compared with the extracts which are commercially obtainable and express the hope that before it becomes necessary to revise the Pharmacopœia, definite requirements can be drawn up for the test substance itself and that an accurate co-ordination of the required pharmacopœial strength and of the common pharmaceutical practice may be secured.—J. Am. Pharm. Assoc., 6 (1917), 131. (L. S.)

Vermiform Appendix.—*Organotherapy of.*—E. Savini is strongly of opinion that the vermiform appendix is by no means inert and

functionless. Doses of 0.25 Gm. of dried appendix generally caused, after about an hour, an abundant stool of medium consistence. No intestinal colic nor diarrhea was observed. The effect was repeated by further doses at intervals. Appendix powder appears to exert an almost specific motor-excitant action on the peristaltic movements of the large intestine, which is probably due to a hormone secreted by the appendix. These conclusions confirm and supplement those of Robinson, who found the appendix to exert a digestive action on proteins and carbohydrates, and that its acid secretion has a definite physiological function. The existence of chronic constipation due to appendicular insufficiency is probable, and points to its treatment by the administration of powdered appendix.—Compt. rend. Soc. Biol.; through Pharm. J., 98 (1917), 439.

Wool-fat.—*Preparation of.*—Sheep wool contains from 6 to 35 per cent. of wool fat. The wool is first deprived of the suint, which consists chiefly of potassium salts, by washing with water. It is then washed with a warm soap solution, which removes the wool fat. To this solution, mineral acids or salts are added and thus either a mixture of wool fat with fatty acids or wool fat and soap are obtained. The saponifiable fatty acids are then separated from the unsaponifiable wool fat by converting them into calcium, barium or magnesium soaps and extracting the mixture with acetone. The soaps are decomposed with acids and the resulting brown-black mixture of fatty acids purified by distillation with superheated steam. The wool fat obtained from the acetone solution is purified by means of kieselguhr and animal charcoal.—Südd. Apoth. Zeit.; through Pharm. Weekblad, 54 (1917), 376. (H. E.)

Egg Yolk.—*No Lecithin in.*—Recent experiments of N. A. Barbieri appear to show that lecithin (containing glycerol, phosphoric acid, and stearic acid) is not present in egg-yolk. Fats may be quantitatively separated in a pure state from egg-yolk by extraction with neutral solvents. On saponification, they yield only glycerol and fatty acids. These fats are able to keep in solution or suspension nitrogenous substances, coloring matters, and phosphates, and these substances can be separated by dialysis, by hydrolysis with a very weak acid, or by repeatedly washing the alcoholic solution with water. The residual fats remain completely unaltered. The whole of the phosphorus in egg-yolk is in the state

of phosphoric acid in combination with alkali bases (potassium, sodium), alkaline-earth bases (calcium), and magnesium. Glycero-phosphoric acid cannot be separated by means of neutral solvents, but only by saponification. On decomposing the soap with acids, the glycerol and the phosphoric acid derived from the phosphates pass into the aqueous solution. No trace of choline is present in egg-yolk. The so-called choline constituent of the alleged lecithin is a product of the hydrolysis of ovochromin or a putrefaction product.—Gaz. chim. Ital.; through Pharm. J., 98 (1917), 469.

INORGANIC CHEMISTRY

A—GENERAL SUBJECTS

ATOMS AND MOLECULES.

Gramme-Atom and the Faraday.—*New Chemical Nomenclature.*—Carl Herting in "Consistency of Terms and Conceptions," mentions that in order to talk quantitatively about electrons, the entities which compose atoms, a new nomenclature has been created. A "life-size" atom is imagined consisting of millions of real atoms. It is unnecessary to know the exact number, as long as those of the different elements are enlarged in proportion. If the atomic weight of H = 1, then the "life-size" atom will weigh 1 Gm. and still more correct if H = 1.008, then this "Gramme-Atom" will weigh 1.008 Gm. and Fe = 55.84 Gm., Cu = 63.57 Gm., etc. Consequently Gramme-Atoms represent the atomic weight of the element in Gms., the same as Gramme-Molecules represent the molecular weight of the compound.

This ingenious scheme of the chemist to overcome this difficulty also suggests that a similar method is used to establish a substantial, workable, "life-size" electron. Fortunately a simple relation exists which makes this quite practical. According to Faraday's Law an atom of any element required exactly the same quantity of electricity to oxidize or reduce it electrochemically per unit change of valence, hence the gain or loss of exactly the same number of electrons. For the enlarged Gramme-Atom it is known definitely that this quality is equal to 96494 coulombs or 26.8 Ampere-hours, which is also a very easily measured quantity

which has received the name of a Faraday. This is also correctly termed Gramme-Atom-Electron, a "life-size" electron, which can be used in calculations and in the literature. One Gramme-Atom of H (1.008 Gm.) loses one Faraday or "life-size" electron (26.8 Ampere-hours) on being reduced. One Gm.-Atom Fe (55.84 Gm.) gains three enlarged electrons (3 Faradays = 80.4 Ampere-hours) on being oxidized from the ferrous to the ferric state. Therefore each of the + or — signs placed over the symbols of atoms showing the free charges carried after dissociation, and every unit of valence represents one enlarged electron or one Faraday if the symbol represents a Gramme-Atom. Similarly each bond then represents quantitatively the attraction of one negative Faraday or enlarged electron on one element to one positive electron on the other.—Sc. Am. Suppl. No. 2166, July 7, 1917, 16. (O. R.)

Atoms.—*Their Reality.*—A. Findlay gives an interesting general paper on atoms in which he states among other interesting data, that the hydrogen molecule weighs three quadrillionths of a gramme, that its diameter is about one one-hundred millionth of an inch and that its velocity is several hundred yards per second.—The New Statesman; through Chem. News, 116 (1917), 8.

Matter and Energy.—*The Co-existence of.*—F. A. Dugan presents a paper on this complex subject that should be read by every teacher of chemistry. He is not satisfied with the electron theory of matter, which he considers as leading to the hypothesis that actual matter does not exist. He believes that is nearer the truth to state that energy is mass in motion. This he illustrates aptly in the complex operations accompanying the burning of an ordinary candle, asking if it is unreasonable, after accepting the fact that a liquid is more dilute matter than is a solid and a gas is more dilute matter than is a liquid, to assume that further attenuation of matter will not lead to the ether, to heat, to light, and to all other forms of energy.—Chem. News, 115 (1917), 237 and 243.

PHYSICAL CHEMISTRY.

Crystallo-Chemical Analysis.—T. V. Barker describes how, by means of the above method, after an examination lasting sixty-five minutes, he identified a crystal weighing less than 0.0001 Gm. of

unknown composition and intestinal origin as "salol," and sketches the evolution of the method, which has been greatly simplified by the labors of M. Fedorov and his pupils, MM. Artemiev, Sokolov, and Barker, together with the procedure for the identification of the salol crystal. With regard to the future of crystallography, it is evident from the above instance that the science embraces a sphere of useful application in nearly all branches of knowledge, including those dealing with life-processes. The specialist in chemistry, physics, or medicine can be of the utmost assistance to crystallography, and indirectly to his own subject, if he would only facilitate a more liberal recognition of its claims to be regarded as a worthy branch of inquiry. No substance can be identified unless it has been previously subjected to crystallographic investigation. It is evidently beyond the power of the relatively small numbers of crystallographers to cope with substances as fast as they are turned out by synthetic chemists. . . . It is, therefore, to be hoped that the chemist (in the wide sense of the term) will not take advantage of the ignorance of the enthusiastic crystallographer, but will confine his requests to such substances as are likely to have a direct influence on the development of science.—*Lancet*; through *Pharm. J.*, 98 (1917), 457.

Density of Solids.—Le Chatelier and Bogitch state that the ordinary methods of determining the density of solids rarely give a figure closer than within 1 per cent. of the truth, due chiefly to the air adhering to the solid immersed in water. They determine such densities by weighing the substance in granular form (about 2 mils in volume) and then adding it to carbon tetrachloride, pure benzene or petroleum ether contained in glass tube graduated to $\frac{1}{10}$ mils. From the augmentation in volume, the density of the solid may be deduced.—*Compt. rend.*; through *J. pharm. chim.*, 15 (1917), 30.

Drop Measurements.—Much has been written regarding the size of drops obtained from various liquids and by means of different dropping apparatus. Dr. Robert Donald emphasizes the importance of holding the pipette vertically or nearly so. A few experiments proved that the horizontal drop is three times the volume of the vertical drop. The point has been raised in connection with

a recommendation for conducting the Wassermann reaction on a large scale.—Lancet; through Pract. Drug., Feb. 1917, 30.

Iontophoresis.—H. Koller says that when a salt is dissolved in water the solution consists not only of an attenuated distribution of the salt molecules in the water, but also of a splitting of a certain part of the molecules, according to the degree of concentration, into their two components, a basic and an acid part. These parts may consist of one or of several atoms and are electrically opposite. It is assumed that the chemical valence is saturated through union with an electric ether particle, an electron.—Corres-Blatt f. Schweiz. Aertze; through Am. Drug., 65 (1917), 452.

Perevaporation, Perdistillation and Percrystallization.—These terms have been coined by P. A. Korber to designate the following physical phenomena:

The rapid evaporation of a solution suspended in the air in a collodion bag is termed perevaporation. The vapor of water is given off almost as if no membrane were present. By this means a solution of serum albumin was evaporated to complete dryness, at 37° C. in twenty-four hours. A sterilized meat broth was evaporated to the consistence of an extract in an incubator without fanning. A collodion bag, shaped like a test-tube, was shrunk in boiling water, filled with water, and heated over a naked flame. The contents evaporated so quickly that the level of the liquid sank like that in an emptying bottle, and the temperature of the liquid did not rise above 70° C. If a 300-watt electric heater was immersed in a bag containing 400 mls of boiling water the liquid did not boil, but evaporated at the rate of 10 mls a minute. Perdistillation may be performed by suspending the bag of liquid in a cold bottle and heating the liquid in the bag electrically or by steam. A saturated solution of ammonium sulphate in such a bag suspended before a fan, evaporated so that crystals formed on the outside and flew off in the air current, like snow. A number of similar experiments are described showing the extreme rapidity of evaporation through a collodion membrane. The accompanying illustrations (Figs. 11 to 13) show the apparatus used.—J. Am. Chem. Soc., 39 (1917), 944.

Periodic System.—*Relation to Spectrum Analysis.*—Kutter groups the metallic elements giving a satisfactory spectrum in the

Fig. 7.



Fig. 1.

Sterilized Pervaporator

Fig. 8.

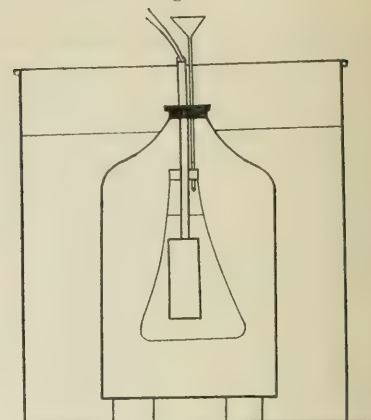


Fig. 2.

Electric Perstillator

Fig. 9.

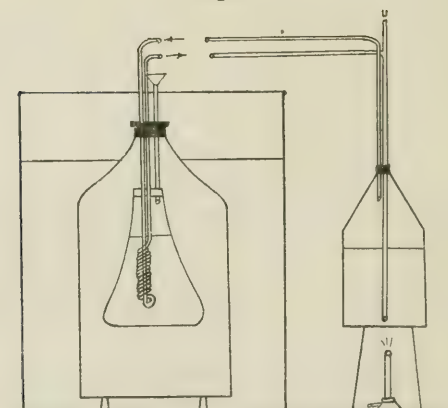


Fig. 3.

Steam Perstillator

Bunsen flame in group one, those giving under similar conditions only a feeble spectrum in group two, those giving no spectrum in the Bunsen flame in either the third group (yielding a spectrum with ordinary spark discharge), or the fourth group (requiring condensed spark discharge). The relative volatilities thus indicated appear to be a periodic function of the atomic weight.—Physikal. Z., 18 (1917), 16; through J. Chem. Soc. Abstracts. (A. V.)

Solutions.—*A Study of Some Percentage.*—T. J. Bradley discusses the question of making a definite volume of solution of any stated strength when the specific gravity of the finished solution is unknown. Such solutions are frequently prescribed and if they are not to be absolutely correct they should at least approximate the required strength and volume.

The rather common method of weighing the correct amount of chemical and then adding enough of the solvent to make it up to the volume asked for may be sufficiently accurate for weak solutions, but a 50 per cent. solution, for example, of such substances as silver nitrate, argyrol, potassium iodide, will fall far short of the right strength.

Taking as much solvent as solution required and adding to it enough of the chemical to make 100 parts by weight gives a solution of correct strength but it is wasteful.

Mr. Bradley made a series of experiments with quinine bisulphate, which is of average density, and of silver nitrate, which is heavy, and gives the results in tabulated form, showing the specific gravity of the solution, weight of 1 fluidounce, and weight of salt required, for each given percentage. The tables indicate that the common methods are approximately correct up to about 5 per cent. for either and to about 10 per cent. for the alkaloidal one. Mr. Bradley intends to extend the tables to include other chemicals used in percentage solutions.—J. Am. Pharm. Assoc., 6 (1917), 955. (Z. M. C.)

Solvents in Pharmacy.—J. U. Lloyd contributes a paper which was one of a series begun in 1879, but of which only a few were published. He directs attention to our limited knowledge of menstrua, which afford such a big field, especially to the lack of investigation of the physics involved. Of the general phenomena con-

nected with the subject, attraction, cohesion, adhesion or structural affinities, capillary attraction play important roles.

Reagents or solvents should meet pharmacopœial requirements but absolute purity is not essential.

Acid solvents aid in extracting alkaloids and mineral salts but some solvents cannot be acidulated except by the vapor of volatile acids or by mechanical agitation. The "sour smell" objection may be overcome by using an odorless vegetable acid like citric. The value of acid solvents has been much underrated.

Alkaline solvents are useful with alkaloid-bearing plants because they break down the natural plant texture and liberate the alkaloid in the tissue. This makes extraction with alcohol much easier; it permits a washing with water or a percolation with some special solvent in order to free the alkaloidal plant of undesirable substances prior to percolation for the alkaloid itself. It must be borne in mind that the alkaloid is not obtained in its natural condition but is a chemically altered product. Sometimes an alkaline menstruum is valuable because of the greater solubility of the salt formed than of the original vegetable acid, *e. g.*, polygalic acid of senega and glycyrrhizic acid of glycyrrhiza. Alkalies also reduce the solubility of mineral salts and may be used to free a drug of calcium sulphate or phosphate before extraction of the active principle.

Syrup is a good solvent for some plant constituents and acts as a preservative for many substances: for instance, its solvent action on calcium salts is well known as is its preservative action on iron iodide, lactate and carbonate. Potassium citrate has proved a valuable medium for mixing tannates with iron salts, but it has been generally overlooked that it is a valuable addition to aqueous or hydro-alcoholic menstrua for astringent plants like calumba and gentian. The percolate is a much more permanent solution than if the menstrua had been simply alcohol and water and it mixes more freely and perfectly with iron salts without discoloration or precipitation.

The apparatus used in carrying out the experiments on solvents consisted of a 10 mil graduated glass stoppered cylinder, something which is practicable for any druggist. Absolute cleanliness even to minute traces of grease was the rule as well as total absence of water except where water was to be used in the solvent.—J. Am. Pharm. Assoc., 6 (1917), 940. (Z. M. C.)

Water of Crystallization.—*Effect of Light on.*—Well-formed crystals of chrome alum and of cobalt-magnesium sulphate were observed to lose water of crystallization where their surfaces came in contact with a metal support. The spots increased very rapidly in size when the crystals were exposed to light. It was found that the loss of weight of crystals exposed to ultra-violet light, and to sunlight, was respectively twice and two and a half times as much as that observed in similar crystals kept in the dark.—Chem. Zentr.; through Pharm. J., 98 (1917), 275.

COLLOIDS.

Perfumery.—*Colloidal Chemistry of.*—P. Rohland states that his experiments do not agree with the statement of Chapman and Siebold that kaolin adsorbs Congo red, Bismarck brown, etc., because they are substantive and basic dyes, while acid dyes, like eosin, are not adsorbed. The salient point is whether the dye in solution is colloid or crystalloid. The more colloidal a dye, the more readily it is adsorbed by the colloidal clay or kaolin. The German and Austrian kaolins are equal to the English. By means of Rohland's method the determination of the adsorptive power of kaolin towards complex dyes enables one to determine quickly the quality of a kaolin relative to its use in the perfumery and soap industries. The adsorptive powers of different talcs were also determined; its strong adsorptive power renders talc quite useful in perfumery and dermatology. Simple dyes are not adsorbed by clay, kaolin and talc, but the complex dyes are adsorbed. In the adsorption process the dyes are rendered completely insoluble in H_2O . In addition to the colors, odors (good and bad) are adsorbed by kaolin, talc and colloidal clays. On shaking an iron saccharate solution with colloidal clay the sweet taste passes to the clay, while the saccharate solution acquires a clayey taste.—Deut. Parf-Ztg.; through Chem. Abstracts, 11 (1917), 1723.

Tanning.—*Colloidal Chemistry of.*—All vegetable tanning materials contain a peptizer and a peptizable substance, the proportion of which determines the colloidal properties of the aqueous extract. Tannin is the peptizer; the peptizable substances include polymerized tannin, ellagic acid, catechin and phlobaphenes. The peptizer forms a solid solution with the hide substances and plays

a double role in the tanning process. The phenomena of tanning, according to W. Moeller, result solely from irreversible colloidal actions, there being no purely chemical changes. The ancient process of bark tanning is an example of slow peptization taking place during the tanning.—Z. Angew. Chem.; through Sc. Am. Suppl. No. 2157, May 5, 1917, 285. (O. R.)

ANALYTICAL CHEMISTRY.

Analytical Chemistry.—*Its Relation to Medicine*—A. v. St. George states that the determination of the sugar concentration of the blood is of greater value than that of the urine in the diagnosis and treatment of diabetes mellitus; that uric acid in the blood establishes the presence of "gouty diathesis." He furthermore directs attention to the diagnostic importance of the determination in the blood of non-protein or waste nitrogen, urea, creatinine and carbon dioxide in cases of nephritis, nephritic toxemia, eclampsia and acidosis.—C. U. C. P. Al. J., 24 (1917), 152. (J. H.)

Analysis of Pharmaceuticals.—L. F. Kebler and co-workers contribute a valuable paper on methods of analysis of pharmaceuticals, which should be read in full by all interested. The preparations discussed are:

Aromatic Spirit of Ammonia.—This was assayed for the percentage of ammonium carbonate and of ammonia water. Of 52 samples tested, only 18 came within a 10 per cent. variation of the standard.

Camphor Liniment.—This was assayed for camphor content. Of 42 samples examined, 17 came within a 10 per cent. limit.

Lime Water.—This was assayed according to U. S. P. VIII. Of 62 samples examined, 47 came within a 20 per cent. variation.

Paregoric.—This was assayed for morphine and alcohol. Of 99 samples examined, 72 came within a 20 per cent. variation.

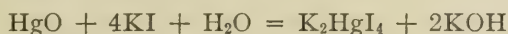
Soap Liniment.—Assayed for camphor and alcohol. Of 44 samples collected, 19 came within a 10 per cent. limit.

Spirit of Nitrous Ether.—Assayed for ethyl nitrite and alcohol. Of 79 samples, 34 failed to come within a 20 per cent. margin.

Tincture of Iodine.—Assayed according to U. S. P. VIII for iodine and potassium iodide. Of 65 samples, 38 came within a 10 per cent. variation.

A number of prescriptions were also submitted to druggists for compounding and the resulting mixtures were analyzed. The results showed that there is considerable room for improvement.—J. Am. Chem. Assoc., 6 (1917), 614 and 684. (H. H. S.)

Yellow Mercuric Oxide.—*As a Standard for Volumetric Acid Solutions.*—Incze reports that yellow mercuric oxide can conveniently be used for standardizing acids because an alkali-free caustic potash solution can be made with it. The reaction takes place according to the equation



within a few minutes, when 20 times the amount of potassium iodide necessary for the reaction is present, while in the absence of such an excess the reaction is reversed. One-half gramme of the mercuric oxide is allowed to stand for 20 minutes with 10 mls of a neutral 60 per cent. potassium iodide solution and the alkali is then titrated with acid. Theoretically any indicator could be used in the titration but it was found that methyl orange is the most suitable.—Z. anal. Chem.; through Pharm. Weekblad, 54 (1917), 1356. (H. E.)

COMMERCIAL CHEMISTRY.

American Drug Trade.—The total value of the dyes, drugs, chemicals, etc., imported into the United States in the 10 months ended October 30 last, was \$109,422,582, against \$70,142,738 in the corresponding period a year ago, and \$68,744,756 in 1914. There was a falling-off in the imports of opium, which totaled only 80,870 lbs., valued at \$567,967, against 305,755 lbs., valued at \$1,490,220 for the corresponding period of 1915.—Chem. and Drug., 89 (1917), 79. (K. S. B.)

Chemicals and Drugs.—*The Influence of the War on the Quality of.*—A. W. Van der Haar reports on the number of chemicals examined during the last few years of which the following may be mentioned:

Potassium acetate, an English preparation, contained chloride and sulphate.

Sodium acetate contained traces of chlorides and heavy metals.

Wool-fat: several samples possessed a dark brown color.

Ammonia water almost always contains lead.

Extract of licorice: Much extract of inferior quality was found on the market, some containing less than 20 per cent. of glycyrrhizin and some were rich in asparagin.

Kamala: Several samples left a high percentage of ash on incineration.

Magnesium oxide: Most of the samples examined contained 30 per cent. of carbonate.

Podophyllin samples with 5 per cent. of ash were found.

He also reports that in general, chemicals and drugs imported into Holland were of good quality and that the products manufactured in this country left nothing to be desired.—Pharm. Weekblad, 54 (1917), 256. (H. E.)

Drugs.—*British Exports and Imports.*—Drugs and medicines valued at \$380,000 were shipped from the United Kingdom to Malaya during 1916, compared to \$269,000 in 1915; the chemical imports were valued at \$461,000 against \$237,000 in 1915.—Chem. and Drug., 89 (1917), 877. (K. S. B.)

Drugs and Chemicals.—*Indian Imports.*—The imports of drugs and chemicals into British India amounted to £2,368,835 during 1916, against £1,830,028 in 1915 and £1,485,750 in 1914; the dyes and color imports amounted to £1,316,599 in 1916, against £811,087 in 1915 and £1,235,813 in 1914.—Chem. and Drug., 89 (1917), 460. (K. S. B.)

Drugs and Chemicals.—*South African Imports.*—During the month of July 1917, the imports of drugs, chemicals and apothecaries wares into the South African Union amounted to £89,302 against £90,600 in July 1916, which brings the total for the seven months ended July 1917 to £552,864, against £661,471 for the corresponding period of 1916. The imports of apothecaries' wares of all kinds declined this year, being only £43,030 against £81,953 last year. Medicinal preparations were valued at £67,256 against £76,242 last year. There were larger imports of disinfectants and germicides during 1917, the value for the seven months being £41,673 against £39,246 in 1916.—Chem. and Drug., 89 (1917), No. 1969, Supp., xxxix. (K. S. B.)

Drugs, Chemicals, and Dyes.—*Dutch Exports.*—The following figures (millions of kilos) show the Dutch exports of drugs, chemicals and dyes for the three years noted:

	1914.	1915.	1916.
Total export.....	520.1	220.6	124.5
To Germany.....	186.5	83.1	21.7
To England.....	87.9	29.6	26.3

—Chem. and Drug., 89 (1917), No. 1969, Supp., xxxix. (K. S. B.)

NON-METALLIC ELEMENTS.

OXYGEN.

Oxygen.—*Specifications for Medicinal.*—T. Adamson of the New York City Board of Estimate suggests the following specifications for oxygen for medicinal use:

“Compressed oxygen shall contain at least 98 per cent. of oxygen by vol. It shall give no coloration when 2 liters are bubbled through a solution of potassium iodide and starch, at the rate of 4 liters per hour. On quantities of 1000 cubic feet and more, one cylinder shall be selected at random and the contents of this cylinder tested. On quantities less than 1000 cubic feet, the chemical tests may be waived. All chemical and physical tests shall be made in accordance with the Board of Estimate’s standard methods of test. It shall be delivered in steel cylinders which shall have been manufactured and tested in accordance with the regulations of the Interstate Commerce Commission, and the date of the last test shall be plainly legible. The capacity of the containers shall be certified by a recognized testing laboratory, and the certificates shall be subject to inspection on request. Payment shall be made for the number of cubic feet of gas at 21.1° and 760 Mm. pressure accepted, at the price bid per cubic foot. The pressure of each cylinder shall be tested immediately on delivery and shall register at least 1800 pounds per square inch. Cylinders registering less than 1800 pounds at the time of delivery shall be rejected.—J. Am. Med. Assoc., 68 (1917), 1621.

Ozone.—*Determination of.*—M. David has found that pure iron-ammonium sulphate in very dilute sulphuric solution is not oxidized in the air, but absorbs ozone more rapidly than any other substance. Thus ozone can be determined by allowing a solution of iron ammonium sulphate to absorb it and then titrating directly

with potassium permanganate. To prepare the liquids, 3.920 grammes of the sulphate are dissolved in distilled water to which 20 mls of pure sulphuric acid at 66° are added and the solution is made up to 1 liter at 15°, and 0.316 gramme of crystallized pure permanganate is dissolved in distilled water and the solution made up to 1 liter at 15°.—*Compt. rend.*; through *Chem. News*, 115 (1917), 215.

Ozone.—*Surgical Use of.*—Stoker has applied ozone in twenty-one cases of wounds. It is a strong stimulant, he says, and determines an increased flow of blood to the affected part. It is a germicide which destroys all hostile micro-organic growth. It has great powers in the formation of oxyhemoglobin. The ozone is applied on the wounded surface or to the cavities and sinuses for a maximum time of fifteen minutes, or until the surface becomes glazed. Ozone has the particular power of disclosing dead bone, foreign bodies, septic deposits, etc. This, the author believes, it does by destroying the granulations and micro-organic growths (presumably unhealthy) that are found in close contact with septic deposits, foreign bodies, or dead bone. Wounds, sinuses, etc., are washed twice daily with boiled water and a dressing of dry gauze is applied. At first ozone causes an increase of the discharge of pus; later the pus is replaced by clear serum, which, at a still later stage, becomes colored reddish or pinkish. In open wounds it is necessary to strip off the parchment-like film surrounding the edges, which is composed of oxidized serum. This is easily effected by applying a hot compress for fifteen or twenty minutes, after which the film can easily be peeled off with dissecting forceps.—*Lancet*; through *Drug. Circ.*, 61 (1917), 76.

Hydrogen Dioxide.—*Molecular Rearrangement Produced by.*—Dubsky reports on the action of dioxide on cyanides, and especially potassium ferricyanide. When a solution of the latter is mixed with hydrogen dioxide solution at 40° the color changes from light yellow to brown-yellow. On evaporating the mixture, beautiful crystals are obtained which have the same empirical composition as potassium ferricyanide $K_3Fe(CN)_6$, but which when dissolved in water form a dark red solution which when concentrated appears almost black.—*J. prakt. Chem.*; through *Drug. Circ.*, 61 (1917), 245.

HYDROGEN.

Hydrogen.—*Production by the Iron Contact Method.*—Harry L. Barnitz, explains in detail the history of the operation of this method of obtaining hydrogen. He records the various patents which were taken up from its discovery in 1878 up to the present time.—Am. J. Pharm., 89 (1917), 313. (I. G.)

Distilled Water.—*Neutral for Microscopy.*—L. Tribondeau states that the interference with stains by distilled water, which is not absolutely neutral is a familiar trouble to microscopists. This may be avoided by treating ordinary distilled water with silver carbonate, or oxide, and redistilling it.—J. pharm. chim., 15 (1917), 362.

Drinking Water.—*Removing Taste of Algæ from.*—Dr. A. C. Houston, the Director of Water Examination of the London Water Board, finds that potassium permanganate in quantities of 2.5 to 5 pounds per million gallons is much more effective than hypochlorites in removing the nauseous taint, due to the growth of algæ in the reservoirs under the Board's control. When hypochlorites are used, as recommended by Rideal, there is a danger of merely substituting one taste for another, or even of introducing a super-added taste.—Brit. Med. J.; through Pharm. J., 98 (1917), 139.

Drinking Water.—*Determination of Amount of Hypochlorite Needed for "Javellization."*—Massy discusses the methods used to determine the amount of chlorinated lime or the solution of hypochlorite necessary to purify a batch of drinking water. Gascard and Guy-Laroche adds to five samples, each 100 mls of water, 1, 2, 3, 4 and 5 drops, respectively, of Javel water diluted 1 to 200. To each sample a crystal of potassium iodide and some starch paste are added. The sample containing the least amount of hypochlorite solution, that is still blue, gives the figure to be used in chlorinating the water with the Javel water under observation. The Worrock test, used by the British medical corps employs zinc iodide-starch reagent against chlorinated lime used for water purification. Massy, on the other hand, prefers to test the hypochlorite by its bleaching power on solution of sodium sulphindigotate.—J. pharm. chim., 15 (1917), 209.

Hot Water.—*Use in Constipation.*—It is suggested that the undoubted value of the practice of drinking a tumblerful or more of

hot water at bedtime, in many cases of chronic constipation is due mainly to the vesicorectal reflex, rather than to any action of the water itself. H. Gifford has observed that if micturition were postponed until the desire became acute, the bowel would also move if the opportunity were afforded. By making systematic use of this reflex, he was able to abandon the use of laxatives, which had previously been necessary for twenty years. It is contended that the favorable action of water is due to the distension of the bladder, which stimulates the bowel to activity. The same reflex is probably one of those which promotes the normal morning evacuation of the intestines.—J. Am. Med. Assoc., 68 (1917), 304.

Water.—*Bacillus Coli in Tropical.*—Zammit and Marich point out that it has been the harassing experience of colonial authorities that after having spent very large sums in providing good water supplies, and despite all efforts to find any source of contamination, biological reports have declared such waters to be unfit for drinking purposes on account of *Bacillus coli communis* being present in sufficient numbers to reach the usually-adopted European standard of condemnation. Scientific observers abroad will be glad to see that the anomaly has been cleared up, as the following extract shows: "In the interpretations of the results of water examination, the standards of purity in common use among sanitarians in England are not suitable to the conditions which prevail in tropical and sub-tropical climates. In Malta, springs containing coli-like organisms were otherwise pure, and there had been no outbreak of any water-borne diseases. Rain-water, carefully collected, contained some coli-like organisms."—J. State Med.; through Pharm. J., 98 (1917), 161.

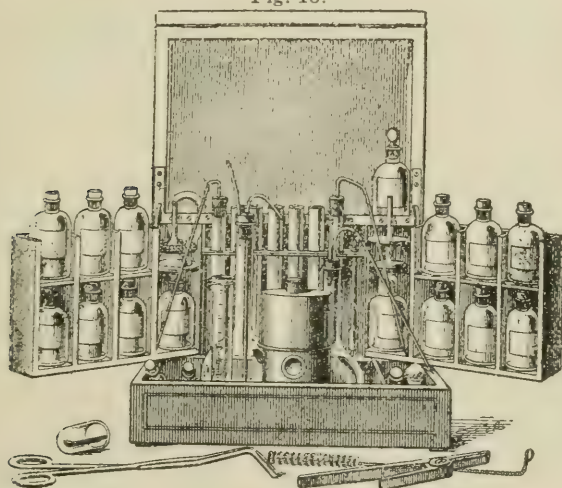
Water.—*Determination of Hardness by Colloids*—Berczeller points out that the surface tension of soap solutions is diminished considerably by addition of weak amounts of alkali hydroxides but increased if small amounts of calcium or magnesium salts are added to such alkaline solutions. He suggests that upon these observations a method may be based for the determination of hardness of water.—Biochem. Z., 84 (1917), 149; through J. Chem. Soc. Abs. (A. V.)

Water.—*Counting of Coli bacilli in.*—L. Bourdet discusses the previously published methods of Vincent, Péré-Gautié, Grimbart and Dienert and then points out that the bacilli form into groups in

certain portions, making it necessary to try cultures from a large number of samples if accurate results are to be obtained. He recommends attempting cultures from 3 100-mil samples; 3 50-mil samples; 4 20-mil samples; 6 10-mil samples; 6 5-mil samples; 8 2-mil samples and 10 samples each containing 1, 0.5, 0.25, 0.10 and 0.05 mil of the water under examination. He also considers that coli should be reported only when from 66 to 90 per cent. of the samples (according to amount of water used) produce cultures.—J. pharm. chim., 15 (1917), 5.

Water.—*Rapid Toxicological Examination in the War.*—M. Benvist describes the need of rapid work by the pharmaceutical corps in determining whether the wells and cisterns in newly occupied districts have been poisoned. For streams of any size there is no need of such work, as the amount of chemical needed to effectually poison a river is too great to make it worth while. He describes a case of his own devising for carrying all of the necessary reagents and utensils (Fig. 10). This contains materials for test.

Fig. 10.



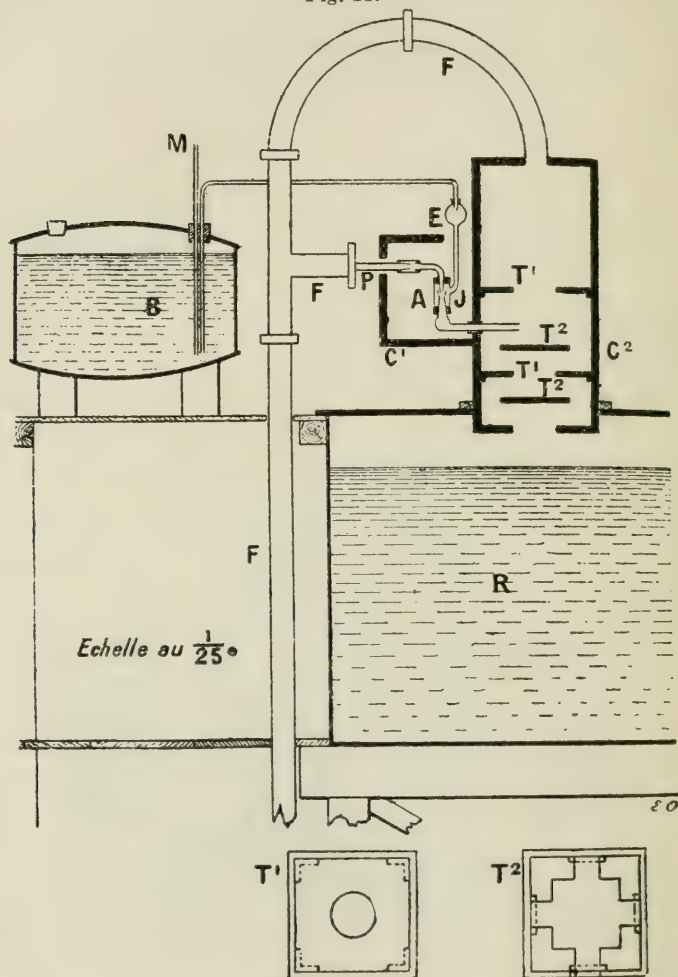
Case for Water Analysis.

ing for metals (H_2S apparatus); organic matter (permanganate); chlorides ($\text{N}/_{10}\text{AgNO}_3\text{V.S.}$); phosphates (nitromolybdic reagent); arsenic (Bougault's reagent); mercury (test-tube, sulphuric acid and copper spiral); cyanides (ferrous sulphate, ferric chloride and

soda solutions) and alkaloids (chloroform and Bouchardats reagent). He gives his quick methods by which the tests can be done in 1 hour.—*J. pharm. chim.*, 15 (1917), 149.

Water.—"Javellization" at the Front.—A. Vila discusses the

Fig. 11.



Javellization of Water.

securing of a supply of drinking water at the front and the methods used in chlorinating it. He states that 0.5 milligramme of chlorine (as NaOCl) to the liter of water is sufficient to remove all danger-

ous germs and that this amount does not affect the taste of the water. He points out the difficulty in feeding the sodium hypochlorite solution, used in the French Army for the chlorinating, in regular amounts without waste and then describes the ingenious apparatus devised by him for this purpose, the solution being syphoned into the water as it passes through the main into the storage tank; the passage of water through the main producing enough suction on the glass aspirating apparatus to start the syphon from the barrel holding the hypochlorite solution, to cause the proper amount to syphon over and meet the water from the main in a mixing box. The accompanying illustration (Fig. 11) shows the apparatus.—J. pharm. chim., 15 (1917), 277.

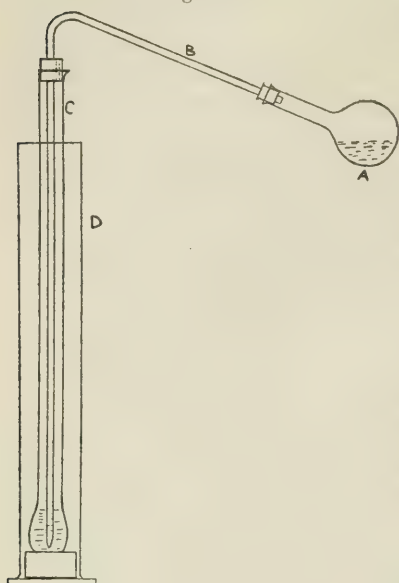
HALOGENS.

Chlorine.—*Liquid Form for Dakin's Solution.*—G. Ornstein has devised a way of enclosing exactly 5 grammes of liquid chlorine in glass ampuls capable of standing a pressure of 350 pounds to the square inch. The ampul is introduced into the bottle holding the alkali solution by means of a rubber tube attached to the rubber cork sealing the bottle. The butt end of the ampul is fitted in the rubber tube leaving the pointed end hanging downward.—Am. J. Pharm., 89 (1917), 547.

Chlorine.—*Titration by the Volhard Method.*—Kolthoff obtained reliable results with Volhard's method by following the recommendation of Schoorl. The titration was interrupted at the first change in color of the indicator and the mixture then stirred thoroughly before the completion of the titration. He suggests the dilution of the solution containing the chloride and an excess of silver nitrate to a definite volume. After thorough shaking of the mixture, the precipitate is allowed to settle and an aliquot portion of the clear filtrate is titrated with thiocyanate. A correction of 0.7 per cent. on the amount of chloride found should be made, as the silver chloride absorbs about 0.7 per cent. equivalent of silver. By treatment with sodium peroxide in sulphuric acid solution or hydrogen dioxide, free from chlorides, thiocyanates are oxidized and chlorides may thus be detected and estimated in their presence.—Z. anal. chem., 56 (1917), 568; through J. Chem. Soc. Abs. (A. V.)

Chlorides.—*Iodometric Assay of.*—G. Torossian proposes to

Fig. 12.



Chloride Assay Apparatus.

of.—G. Torossian proposes to determine chlorine in chlorides quickly and accurately and without the use of silver nitrate, by mixing the sample with finely powdered manganese dioxide, treating with sulphuric acid in a distilling apparatus, and the chlorine produced by the interaction of the dioxide and the hydrochloric acid set free from the chloride sample by the action of the sulphuric acid is conducted into a potassium iodide solution and the liberated iodine titrated as usual with tenth-normal sodium thiosulphate solution.

The special apparatus used for this purpose is clearly shown in the accompanying illustration (Fig. 12). The procedure and

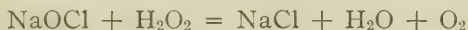
the calculating of results are also explained in detail in the paper. —J. Ind. Eng. Chem., 9 (1917), 751. (I. G.)

Chlorates and Hypochlorites.—*Assay of.*—Rupp determines the quantity of hypochlorite present by diluting 10 mils of a solution containing about 0.5 per cent. of potassium and calcium hypochlorite to 100 mils adding 2 grammes of potassium iodide, acidifying with dilute acetic acid and titrating with N/10 thiosulphate solution. The amount of chlorate is found by adding 1 gramme of potassium bromide and 30 mils of concentrated hydrochloric acid to another portion of the above solution; by treating this mixture with 150 mils of 1 per cent. potassium iodide solution and, after shaking, titrating with N/10 thiosulphate solution. The difference between the two titrations corresponds with the amount of chlorate in the solution.—Z. anal. chem., 56 (1917), 580; through J. Chem. Soc. Abs. (A. V.)

Hypochlorites.—*Chlorine Assay of.*—Dienert and Wandenbulke find that chlorometric assays in acid media give incorrect

results. They therefore titrate in alkaline media or in the presence of ammonium chloride. The amount of the latter salt must not be too great, since it will tend to produce chlorates, or, in the presence of an iodide, iodates. Their suggested procedure is to dilute the hypochlorite preparation with water until the concentration is not more than 500 milligrammes of active chlorine to the liter. To this is added about 150 times as much ammonium chloride (or sulphate) as the chlorine present. Then add some crystals of potassium iodide and titrate the freed iodine with a volumetric solution of arsenic trioxide.—Compt. rend.; through J. pharm. chim., 16 (1917), 153.

Hypochlorites.—*Rapid Gasometric Assay of.*—A. Bury, after discussing the importance of the "javellisation" of drinking water used by the French soldiers and after pointing out the need of frequent assays of the hypochlorite solution used for this purpose, describes a rapid method of assay, based upon the following reaction:



He uses the simplified Bouriez ureometer (Fig. 13) pouring into it first, exactly 1 mil of the hypochlorite solution, then cautiously adding water in the tube until filled within 4 mils of the top and then pouring on top of the water 4 mils of solution of hydrogen dioxide. If this is cautiously done, the hypochlorite and the dioxide solutions will be completely separated by the water layer. The ureometer is then stoppered with a rubber cork fitted with a tube with narrow bore. A finger is placed over this tube and the ureometer is reversed and while thus inverted the finger is removed from the narrow tube, permitting the excess of gas to push out into a graduate as much fluid as the volume of oxygen generated by the reaction. As each volume of oxygen generated represents the same volume of available chlorine in the hypochlorite solution, the French chlorometric degree of the latter is thus directly read off. If the grammes of available chlorine in 100 grammes is the figure desired, multiply the figure obtained by 3.15.—J. pharm. chim., 15 (1917), 190.

Fig. 13.



Hypochlorite Assay Apparatus.

Sodium Perchlorate.—As a Micro-Reagent.—G. Denigès discusses sodium perchlorate in microchemistry.

In 1913 it was shown that sodium perchlorate affords a characteristic micro-crystalline precipitate with cocaine. Subsequently, it was found that the well-known reaction between sodium perchlorate and potassium salts was applicable to the micro-detection of the latter alkali. If a drop of a 4 or 5 per cent. solution of any soluble salt of potassium is treated with a drop of a 1 : 20 aqueous solution of sodium perchlorate, and the mixture is examined under a low power, as soon as diffusion is complete, very numerous characteristic bipyramidal crystals, frequently truncated, somewhat resembling the crystals of magnesium ammonio-phosphate found in urine, will appear in the field. Under like conditions, rubidium and caesium afford typical micro-crystalline precipitates. Lithium, ammonium, and thallium give no such reaction. Besides cocaine, the soluble salts of tropococaine, berberine, narceine, cotarnine, and papaverine all give distinctive crystals with sodium perchlorate. A concentration of 1 : 20, or even 1 : 10, may be necessary for their rapid formation. Sometimes, as with papaverine, the precipitate at first has an emulsion-like aspect; but on re-solution, by warming, followed by friction, a turbidity is obtained which speedily affords tufts of crystals. Morphine, in 1 : 100 solution, or stronger, at once affords spontaneous groups of long needles radiating from a common venter. The perchlorates of its alkyl derivatives, and especially codeine, give perchlorates, which are much more soluble. Brucine, and especially strychnine, give characteristic micro-crystalline perchlorates with great facility. A 1 : 100 solution of brucine salts, or the alkaloid in free acetic acid when treated with sodium perchlorate on a slide, gives crystals spontaneously; and when rubbed with a fine stirrer until turbidity appears, a characteristic micro-crystalline reaction may be easily obtained with a dilution of 1 : 500. These crystals belong to the rhombic system, and may be hexagonal, lozenge-shaped, or octahedra, with rhombic bases. Strychnine gives crystals spontaneously with a dilution of 1 : 200, and on rubbing with a 1 : 1000 solution. In this case the micro-crystals are long, prismatic needles, often in stellate or fasciculated groups. They may be obtained with a few thousandths of a milligramme of alkaloidal salt by the aid of friction. The reaction, therefore, becomes of great value in confirming the presence of these two alkaloids in toxicological work, as specially for the presence of strychnine. Narcotine and veratrine, in presence of acetic acid, give amorphous precipitates with the reagent. They have the aspect of an emulsion of spheroidal corpuscles. With veratrine, the granular

formation is very distinct in a dilution of 1 : 200. Drawings are given of the typical micro-crystals of the perchlorates of strychnine and of brucine.—Ann. chim. anal.; through Pharm. J., 99 (1917), 145.

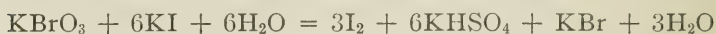
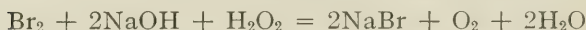
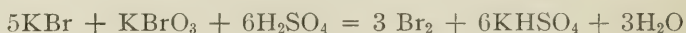
Perchlorates.—*Microchemical Test for.*—G. Denigès uses as reagents (1) a 1 : 100 aqueous solution of strychnine sulphate; (2) a 1 : 50 solution of brucine in 1 per cent. acetic acid; and (3) a 1 : 50 aqueous solution of morphine hydrochloride. A drop of the aqueous solution suspected to contain perchlorate, which should be present as an alkali salt, is placed on a glass microslide so that it forms a deep convex spheroid and is not spread out over the surface. Into this is plunged the point of a finely drawn cut-glass stirrer, previously dipped in either of the above alkaloidal solutions. If a turbidity occurs almost at once, which happens when a moderate quantity of a perchlorate is present, the stirrer is withdrawn and the growth of crystals observed directly with low power without a coverglass; then afterwards, with a higher magnification under cover. If no immediate turbidity is observed, the tip of the stirrer is brought down to the surface of the slide and stirred against the glass in concentric circles with gentle friction. In a short time, a turbidity will appear if perchlorates are present, and in a couple of minutes or so, characteristic crystals may be seen under the microscope. With strychnine sulphate there will be group needles evident with a 1 : 1000 solution of perchlorate. With brucine acetate a 2 to 3 : 1000 solution of perchlorate is requisite to obtain characteristic lozenge-shaped crystals. With morphine hydrochloride a 1 : 500 perchlorate solution is necessary to show the stellate groups of morphine perchlorate. These reactions are the corollary of the author's micro reactions for alkaloïds with sodium perchlorate reagent.—Ann. chim. anal.; through Pharm. J., 99 (1917), 123.

Bromine.—*United States Production.*—During 1915 the output of bromine from the United States was 855,857 lbs.—Chem. and Drug., 89 (1917), 497. (K. S. B.)

Hydrogen Bromide.—*Density of the Gas.*—C. K. Reiman finds that the average of 39 determinations made by him shows that the

weight of 1 liter of hydrogen bromide at 0° and 760 Mm. is 3.6422 grammes.—J. pharm. chim., 15 (1917), 169.

Bromides.—*Assay of.*—Rupp and Hollatz have developed a titrimetric assay of bromides in the presence of chlorides which will be of particular value in the assay of pharmaceuticals. The process is summarized in the following equations:



The manipulation consists in boiling the solution with sodium hydroxide (to remove ammonia which would interfere), then cooling, acidulating, adding a definite excess of bromate followed by alkaline hydrogen dioxide solution, boiling, acidulating, adding potassium iodide and finally titrating the liberated iodine with thiosulphate volumetric solution. Trustworthy results are obtained even when 25 per cent. of chlorides are present.—Arch. Pharm.; through Chem. Abstracts, 11 (1917), 3093.

Bromides and Iodides.—*Argentometric Assay of.*—J. M. Kolt-hoff found that by Volhard's method in the titration of bromides good results are obtained only in the case of a pure salt or a salt containing only small quantities, not more than 4 per cent. of chlorides. If the chlorides exceed this amount unreliable results are obtained. This is due to the different solubility and ion concentration of the two silver halides and silver sulphocyanide. The author further reports that in order to get the maximum coloration by concentrated ferric alum solution one mil should be used in a solution of 10 mils of 4/N nitric acid in 100 mils. Volhard's method cannot be used for estimating iodides because the indicator like all ferric salts, liberates iodine from the halides. For this purpose the use of starch iodide $(\text{C}_{24}\text{H}_{40}\text{O}_2\text{I})_n\text{HI}$ as indicator is recommended and the titration is not carried out in the presence of nitric acid but sulfuric acid is used for acidifying. The author claims that as much as 20 per cent. of chlorides or 2 per cent. of bromides do not affect the titration which they recommend for assaying all the official iodides.—Pharm. Weekblad, 54 (1917), 761. (H. E.)

Iodine.—*Action of Light on Aqueous Solutions of.*—When iodine water or a solution of starch iodide are exposed to light, decolorization takes place within a few hours, while when kept in the dark the color remains intact for a long time. Bordier therefore recommends using these solutions for determining the quality of glass containers used for keeping chemical substances from being affected by light. By his experiments he found that yellow glass does not absorb actinic rays as readily as is generally accepted.—*Compt. rend.*; through *Drug. Circ.*, 61 (1917), 18.

Iodine Compounds.—*Reaction of Ozone on.*—Riesenfeld and Bencker investigated the reactions of ozone with iodine iodates and periodates. The higher the concentration of the ozone in the oxygen used, the greater is the influence of the hydroxyl ions. Ozone does not act on neutral and acid solutions of potassium iodate, but oxidizes it in alkaline solution to periodate. No evidence could be found for the existence for a modification of oxygen containing more than three atoms to the molecule.—*Z. anorg. Chem.*; through *Chem. Abstracts*, 11 (1917), 563.

Iodine.—*As an Antiseptic.*—R. A. Lambert has followed the effect of the same chemical agent on bacteria and tissue cells growing together in vitro. He finds that the growth of tissue cells is more easily affected by potassium cyanide, phenol, tricresol, hydrogen dioxide and alcohol than was the growth of bacteria. Iodine stands out as the one chemical tested to which tissue cells were found more resistant than were staphylococci. A good growth of cells was seen after exposure to a 1 in 2000 solution of iodine for an hour—a strength sufficient to sterilize tissue completely in most instances. Lambert points out that the power of iodine to dissolve fibrin may be an objection to its use as an antiseptic wound dressing.—*J. Am. Med. Assoc.*, 68 (1917), 40. (W. A. P.)

Iodine.—*As Diagnostic Reagent.*—Petzetakis reports that when 15 to 20 mls of filtered urine from patients suffering with tuberculosis or typhoid fever are carefully overlaid with 2 or 3 drops of a solution of 1 gramme of iodine and 2 grammes of potassium iodide in 200 grammes of water, or preferably with 2 to 3 drops of

a 5 per cent. alcoholic iodine solution, a more or less deep yellow color is formed at the zone of contact of the liquids. In normal urine no change of color takes place.—Rep. pharm.; through Drug. Circ., 61 (1917), 8.

Iodine.—*Assay of Compounds in Pharmaceuticals.*—Thompson and Snyder assays iodine compounds as follows:

Iodide in Tincture of Iodine.—Five mils of the tincture are pipetted into a 100-mil Erlenmeyer flask and the iodine determined by the usual thiosulphate method. The contents of the flask are then transferred to a 250-mil separatory funnel, acidulated with 10 mils of acetic acid, and 10 mils hydrogen dioxide and 5 mils of phosphoric acid are then added. After thorough agitation the liberated iodine is shaken out with successive portions of chloroform. The chloroform extractions are collected in a separatory funnel containing 100 mils of distilled water, thoroughly shaken and the washing repeated in order to insure separation of any acid which may have been carried along with the chloroform. The chloroformic liquid is transferred to a 500-mil flask, 100 mils distilled water are added, the mixture is tested for acidity and if positive a small portion of sodium bicarbonate is added. After complete separation, 20 mils of 10 per cent. solution of potassium iodide are added. Tenth normal sodium thiosulphate is now run in from a burette in small portions, and the flask shaken vigorously after each addition. When the chloroform shows only a faint pink color, a few drops of starch solution are added and the titration continued, drop by drop, until no blue color persists. From the total number of tenth normal thiosulphate solution consumed in the latter determination, are subtracted the number of mils consumed in the estimation of free iodine. The remainder multiplied by 0.0166 and the result by 20 will give the amount of potassium iodide in 100 mils of tincture of iodine.

Iodoform Gauze.—The following method of analysis is said to offer little or no possibility of error, consumes very little time, and is not nearly so complicated as the usual distillation method: About 20 Gm. of moist gauze are placed in the reservoir of an extraction apparatus and 50 mils of alcoholic potassium hydroxide solution are added to the extraction flask. The contents of the flask are boiled, which drives the alcohol up into the condenser; the condensed alcohol falling back on the gauze dissolves the iodo-

form and washes it into the solution of potassium hydroxide where it is converted into potassium iodide by boiling. The boiling is continued for about ten minutes after the color has disappeared from the gauze. The contents of the flask are now transferred to a separatory funnel and the method continued as in the determination of potassium iodide in tincture of iodine. One mil of tenth-normal sodium thiosulphate is the equivalent of 0.0131 Gm. of iodoform. The gauze is removed, dried and weighed, the weight added to the weight of iodoform found, and this total divided into the weight of the iodoform will give the percentage of iodoform in the dry gauze.

Iodized Oils.—About 1 Gm. of the preparation is weighed into a tared flask, 30 mils of half-normal alcoholic potassium hydroxide solution are added and the whole boiled in a reflux condenser until the oil is completely saponified. The contents of the flask are transferred to a separatory funnel and about 30 mils of chloroform added and the whole shaken. After separation the chloroform is drawn off and discarded which removes the fats that interfere with the final titration. If an obstinate emulsion occurs it should be broken up with acetic acid. Phosphoric acid and hydrogen dioxide are now added and the iodine is shaken out with chloroform and estimated as in tincture of iodine.

Ointment of Iodine.—A weighed portion of the sample is dissolved in chloroform, water added and the free iodine titrated with tenth-normal sodium thiosulphate solution. To determine the potassium iodide, one gramme of the ointment is weighed into a tared flask with alcoholic potassium hydroxide solution. After removal of the fats with chloroform the procedure is the same as the previous methods. From the total iodine, subtract the free iodine; the remainder is the iodine derived from the potassium iodide.

The method outlined in the above processes has been successfully applied for the determination of iodine in ferrous iodide, calcium iodide, calcium iodized tablets, and it is the belief of the writers that the method is accurate, and rapid, and that it may be applied to practically all combinations of iodine.—J. Am. Pharm. Assoc., 6 (1917), 18. (L. S.)

Iodine.—*Assay in Mineral Waters and in Thyroid Glands.*—D. van Os found that when iodine is liberated from iodides or organic

iodine compounds by fuming nitric acid or nitrite and sulphuric acid and when this mixture is shaken out with chloroform, at times too high results are obtained. He attributes these to the presence of alcohol in the chloroform which is probably converted into ethyl nitrite, which again acts on the sodium iodide formed in the titration of the iodine with sodium thiosulphate. He therefore recommends using alcohol-free chloroform, carbon tetrachloride or carbon disulphide and avoiding an excess of the oxidizing agent.—Pharm. Weekblad, 54 (1917), 350. (H. E.)

Iodine.—*Chloroformic Solution as Germicide.*—Chassevant believes that the violet solution of iodine in chloroform is equal, if not superior, to the brown alcoholic solution as a germicide. It has the great advantage that its application is soothing rather than painful, and it causes no irritation. It may thus be applied freely over a large wound or burn, or an inflamed surface. The strength of the solution recommended is 1 : 30. Its use in furunculosis is strongly recommended.—Rep. Pharm.; through Pharm. J., 98 (1917), 9.

Colloidal Iodine.—Bordier and Roy state their belief that aqueous iodine solutions contain the element in colloidal form, but in the form of granules ("amicrons") that are too small to be seen under the metramicroscope. When gelatin is present in the solution in the proportion of 1 to 4000, these "amicrons" unite into particles sufficiently large to be seen by means of the ultramicroscope.—Compt. rend.; through J. pharm. chim., 15 (1917), 56.

Iodine.—*Harmful in Pyorrhea.*—M. H. Cazin states that "the most sinful practice in employing drugs in this disease is that of using iodine. It is the most common drug used, and the most harmful. It aids the atrophic changes occurring in the alveolar process, which constitutes the fundamental cause of the disease." No agent, it is asserted, should be introduced into those tissues which will aid the retrograde metamorphosis, and this is the most conspicuous physiological action of iodine. It is the agent, *par excellence*, which should be selected if it were sought to defeat the intended object.—Brit. J. Dent. Sci.; through Pharm. J., 98 (1917), 365.

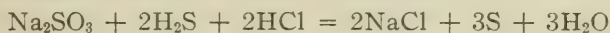
Iodine.—*Reaction with Alkali.*—J. Bougault reports a careful study of reactions obtaining, when iodine is combined with alkali.

Citing Pechard's and Topf's work along this line, he points out that there may be present in such a mixture, free iodine, alkaline hypiodite, alkaline iodate and alkaline iodide. After discussing the different manipulations of the thiosulphate assay whereby the first three may be assayed, noting for example, that the speed with which the thiosulphate solution is added is a factor, he reports experiments showing that when iodine is mixed with solution of sodium hydroxide, iodate rather than hypiodite is formed; that when iodine and sodium carbonate solution are mixed both iodate and hypiodite results, the latter, however, rapidly oxidizing to iodate; and that when iodine is mixed with sodium carbonate or sodium iodide solution, neither iodate nor hypiodite are formed.—*J. pharm. chim.*, 16 (1917), 33.

SULPHUR AND SELENIUM.

Sulphur.—*Colloidal.*—G. Lunan makes this by the following method:

Hydrochloric acid (10 per cent.), 22 mils; sodium sulphide ($\text{Na}_2\text{S} \cdot 9\text{H}_2\text{O}$), 5 grammes; sodium sulphite ($\text{Na}_2\text{SO}_3 \cdot 7\text{H}_2\text{O}$), 2.6 grammes; white of two eggs; sterilized water to 1 liter. Dissolve the sodium sulphide and sulphite each separately in 250 mils of the water, mix together; add the white of egg and thoroughly mix. To this solution add the hydrochloric acid, diluted with 250 mils of the water. The solution is then to be thoroughly mixed, warmed slightly, and sufficient sterile water added to make the volume 1 liter. The solution, after being carefully dialyzed to remove crystalloids, is then ready for use. Theoretically, the product should contain 1 in 1000 of colloidal sulphur. The chemical action is explained as follows:



Thus the sodium sulphite is reduced by the hydrogen sulphide produced from the sodium sulphide and hydrochloric acid. The presence of the albumin appears to prevent the aggregation of the sulphur into masses. In use the dose of 1 mil (about 17 minims) is rendered isotonic by the addition of 0.2 mil (about 3 minims) of 5.5 per cent. saline solution mixed immediately before injecting.—*Lancet*; through *Am. Drug.*, 65 (1917), 495.

Sulphur.—*Solution of.*—C. F. Siegfried in trying to meet the demands of the medical profession for a preparation of sulphur for external use that would penetrate the skin and also leave a fine deposit of sulphur on the surface of the skin, hit upon its solution in carbon disulphide. In looking over the list of possible solvents for this chemical—turpentine, benzene, toluene, chloroform, carbon tetrachloride, and carbon disulphide, he naturally concluded that carbon tetrachloride, because of its non-inflammability would be the safest to use. However, on investigation he found that while it was safe from this standpoint, it was impracticable because it dissolved very little sulphur. He hesitated about using carbon disulphide on account of its characteristic bad odor but found that this can be disregarded because on long standing a solution of sulphur in this solvent loses most of the disagreeable odor. He also found that the most soluble form of sulphur for this solvent was the rolled sulphur. This was readily soluble up to forty-five per cent. Such a solution should be allowed to stand for at least twenty-four hours before it is filtered. In this manner many impurities are gotten rid of. The solution is of a clear, transparent, lemon color fluid and should be kept in a tightly covered container. When this solution is applied to the skin it penetrates it readily, leaves a fine deposit of sulphur which cannot easily be rubbed off. In skin diseases where sulphur is indicated it is a most effective method for applying this drug.—Proc. Penna. Pharm. Assoc., 40 (1917), 244. (J. K. T.)

Sulphur.—*Oil for Intravenous Administration.*—Bory and Jacquot find that in order to obtain the maximum therapeutic effect of sulphur, it should be given hypodermically, preferably by intravenous injection, into the gluteal region, in the same manner as insoluble mercurial salts are administered. For this purpose an oily solution is to be preferred. Sesame oil is recommended as a suitable vehicle. The following is the formula recommended for the injection: Pure precipitated sulphur, 0.20 Gm.; eucalyptol, 20 mls; sesame oil, 80 mls. From 2 to 5 mls are injected slowly. The pain occasioned is but very slight, and the dose is well tolerated.—J. pharm. chim., 15 (1917), 360.

Sulphuric Acid.—*Action of Hydrogen on.*—F. Jones has noticed that pure hydrogen, when left in contact with concentrated sul-

phuric acid, has a strong odor of sulphur dioxide. It appears that hydrogen reduces the acid in accordance with the equation $\text{H}_2\text{SO}_4 + \text{H}_2 = \text{SO}_2 + 2\text{H}_2\text{O}$. The action takes place at ordinary temperatures.—Chem. Trade J.; through Pharm. J., 98 (1917), 257.

Sulphurous Acid.—*Extemporaneous Preparation of.*—Otto Raubenheimer, noting a method given in an Italian journal by Cheney for the rapid preparation of sulphurous acids, experimented along the same lines and devised the following recipe for preparing a solution of sulphurous acid, containing about 6 per cent. of SO_2 in a manner much simpler than that directed in U. S. P. IX.:

Place 14.5 grammes of exsiccated sodium sulphite, U. S. P., into a 250 mil glass-stoppered graduated cylinder or into a bottle graduated to 100 mils. Upon the salt pour 75 mils of diluted hydrochloric acid previously mixed with 20 mils of water, keeping cylinder or bottle cooled with running water. Shake occasionally and if necessary add enough water to make 100 mils.

The product will contain about 12 per cent. of sodium chloride, but the author doubts whether this will be an objection.—J. Am. Pharm. Assoc., 6 (1917), 352.

Sulphurous Acid.—*Extemporaneous Preparation.*—Commenting on the paper just given, R. W. Terry thinks that the presence of 12 per cent. of sodium chloride in the finished acid would be a decided objection. In his chemical work, he has found that when 70 grammes of anhydrous sodium sulphite was treated in a 500 mil Woulfe bottle with 100 mils of water and with 30 mils of concentrated sulphuric acid, cautiously added, the generated SO_2 passed over into 300 mils of water in a 350 mil bottle, kept chilled with ice, gave a solution containing almost 9 per cent. of SO_2 .—J. Am. Pharm. Assoc., 6 (1917), 484.

Selenium.—*Detection.*—J. Meunier points out that selenium, combining with hydrogen, just as arsenium does, and being liberated and deposited in a similar manner from its hydrogen compound during the Marsh process, may lead to error in the usual tests for arsenium by this method. When much selenium is present, the reddish color evident in the sublimation tube enables it to be readily distinguished from arsenium. When small amounts only are present, this is not the case. The author recommends that a current of hydrogen sulphide should be passed through a hot solu-

tion acidified with sulphuric acid. After a time, the sulphur thus precipitated carries down with it as sulphides all the selenium and arsenium present. The precipitate is then aggregated by warming on the water bath, when any brown color will indicate the presence of selenium. If only arsenium is present, the flocculent precipitate will be yellow. By cautiously subliming the brownish precipitate the selenium may be separated from the sulphur.—Compt. rend.; through Pharm J., 98 (1917), 161.

Selenium.—*In Teeth and Bones.*—T. Gassmann finds that selenium is a constant constituent of bones and teeth. Bone ash is dissolved in aqua regia, and the solution treated with hydrogen sulphide. The precipitate obtained is dissolved in ammonia and a few drops of ammonium sulphide, and again precipitated with warm hydrochloric acid. The selenium sulphide is then oxidized into selenic acid by means of nitric acid, and can be identified by crystallization or by conversion into selenous acid.—Z. physiol. chem.; through Pharm. J., 98 (1917), 237.

NITROGEN.

Air.—*Density in Industrial Districts.*—Germann and Booth found the weight of a normal liter of air, determined by the globe method, at Cleveland, was 1.29273 Gm. This value appears to be more accurate for air in populated areas, such as towns and cities, than the figure 1.2930 Gm., found by the author and others, a few years ago, in less populous districts.—Bull. W. R. Univ.; through Pharm. J., 98 (1917), 161.

Nitrogen.—*Fixation of.*—J. E. Bucher has devised a method of the fixation of nitrogen from the atmosphere based upon the fact that the gas will unite with an alkali and carbon in the presence of iron as a catalytic agent, producing cyanide. Thus by mixing together soda ash, powdered iron (or iron ore) and powdered coke and heating the mixture in an ordinary furnace at the same time driving air over the mixture, sodium cyanide is produced. No electric power, no heavy outlay, no expensive chemicals are needed in the process.

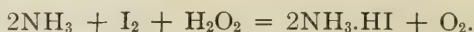
When carbon dioxide produced in the Bucher furnace is passed into the sodium cyanide solution, urea is produced:—J. Ind. Eng. Chem., 9 (1917), 233.

Ammonia.—*Detection of Coal-Tar Products in.*—Whenever ammonia contains coal-tar products, acetone is present and the amount of it seems to be in proportion to the amount of coal-tar products. N. O. Engfeldt found that the process of detecting acetone by its odor is unreliable and he therefore recommends the following method: To 10 mils of the ammonia solution a slight excess of diluted sulphuric acid and a few grammes of calcium carbonate are added. No foreign odor should be produced, not even after heating the mixture. When 10 mils of ammonia water are mixed with 2 mils of caustic soda solution and 5 mils of iodine solution and when the mixture is heated on the water-bath until the brown color has disappeared, no turbidity should be produced at once and no yellow precipitate should be formed after allowing the mixture to stand for some time.—Svensk Farm. Tidsk.; through Pharm. Weekblad, 54 (1917), 162. (H. E.)

Ammonium Chlorate.—*Stability.*—J. Gelhaar conducted experiments with a view of determining the stability of ammonium chlorate, both in solid form and in solution. During the course of seven weeks, 3 grammes of the salt, spread out in a thin layer and exposed to the atmosphere, at ordinary temperatures, lost 80 per cent. of its weight in the form of various gaseous products, a part of the nitrogen being oxidized to nitric acid. Heating at 40° C. caused spontaneous decomposition to take place after a period of 11 hours. Heating 0.50 gramme at 70° C. caused decomposition after 45 minutes. Heating 0.10 gramme at 90° C. after 10 minutes, and heating 0.10 gramme at 100° C. after 3 to 5 minutes. When in solution, the decomposition of the salt took place more slowly.—Z. ges. Schiess.-Sprengstoffw.; through C. U. C. P. Al. J., 24 (1917), 87. (G. C. D.)

Ammonium Iodide.—*Manufacture of.*—When iodine is added to lime, water solution takes place with the evolution of gas and a colorless liquid (in the presence of an excess of iodine a yellow colored liquid), is formed which contains calcium iodide and calcium iodate but not the lower oxidation products such as calcium hypoiodide, according to T. C. N. Brocksmit. By adding hydrogen dioxide solution to lime water, calcium dioxide is formed which by the addition of iodine gives iodide but no iodate. When lime

water is substituted by ammonia water the reaction takes place according to the equation



This seems to be a convenient method for making ammonium iodide.—Pharm Weekblad, 54 (1917), 1373. (H. E.)

Ammonium Sulphate.—*Production in United States.*—The production of ammonium sulphate in the United States in 1916 was 325,000 tons, an increase of 75,000 tons over 1915.—Chem. and Drug., 89 (1917), 846. (K. S. B.)

Nitric Acid.—*Production from Synthetic Ammonia.*—E. B. Maxted, at the meeting of the Society for Chemical Industry, stated that, although one million tons of synthetic ammonia sulphate per annum is manufactured by the Badische Anilin und Soda Fabrik, near Ludwigshaven, the published information regarding the process is extremely scanty, and on the ground that in the present circumstances it may be of special interest, he describes the work undertaken, and the results obtained by his own firm towards the establishment of a technically sound foundation for a synthetic ammonia industry in Great Britain. The most economical method for the manufacture of pure nitrogen is that of low temperature separation from air by utilization of the Pictet process. Hydrogen is obtained by the modified intermittent method from water-gas, which yields a product of the high purity of electrolytic hydrogen, completely free from carbon monoxide. For the synthesis of ammonia itself, nitrogen and hydrogen mixed in the proportions required are compressed to a high degree in order to increase the equilibrium value for ammonia at the temperature at which the catalyst becomes active, this pressure having as its second effect a very considerable increase in the reaction velocity of ammonia formation. The most suitable catalysts available, excluding rare metals, are uranium or iron—the former gives decidedly higher yields of ammonia per passage than iron, but is only prepared and regenerated with difficulty, and is rapidly rendered inactive by traces of water or air in the reaction gases. It is preferable to employ iron containing traces of other bodies as promoters. The cost per ton of synthetic ammonia under normal conditions in this country should work out at about £10 to £12. The synthetic ammonia, when produced, is usually fixed as an ammonium salt; the sulphate as a rule, or the ammonia may be oxidized to nitric acid, and a nitrate formed. This salt, however,

is deliquescent, and, therefore, cannot be transported in sacks. The oxidation of ammonia to nitric acid can be effected by three methods: (1) Oxidation by means of a platinum plug (Ostwald's process); (2) oxidation by means of an electrically heated platinum net, and (3) oxidation by means of base metal catalysis. Substantially satisfactory results have been obtained by the third method, taking advantage of the activating influence on iron of certain bodies, such as bismuth or copper. By virtue of the high speed of passage of the reaction gases over the catalyst, a relatively small catalyst chamber will suffice, for the oxidation of comparatively large amount of ammonia per hour, and since practically no power is required for the operation, the actual conversion cost, exclusive of the necessary materials, is low. From the point of view of power and material, the direct synthesis of ammonia, is more than twice as efficient as the cyanamide process, and more than six times as efficient as the arc process.—Pharm. J., 99 (1917), 62.

Nitrates.—*Phenolsulphonic Test in the Presence of Magnesium Salts.*—M. S. Nichols finds that when the solution of nitrophenol di-sulpho acid is made alkaline just before placing it in the colorimeter, a turbidity may appear due to the precipitation of magnesium hydroxide. This may be obviated by the addition of ammonium chloride in saturated solution, the amount depending upon the alkali used for neutralization.—J. Ind. Eng. Chem., 9 (1917), 586. (G. D. B.)

Nitrates.—*Determination in the Presence of Chlorides.*—W. F. Gericke states that when a solution to be tested for nitrates contains chlorides there is nearly always a loss of nitric acid on addition of the phenol di-sulpho acid. This can be avoided by adding the reagent before the solution is completely evaporated and then evaporating merely to dehydration, not to dryness.—J. Ind. Eng. Chem., 9 (1917), 585. (G. D. B.)

Nitrous Oxide.—*As an Anesthetic.*—This has been tried with what are claimed to be remarkable results in the 1st London General Hospital, Camberwell. The anesthetic is a mixture of nitrous oxide, oxygen, and, if necessary, ether. Its advantages are (unlike chloroform) absence of unpleasant taste at the time and after operation, and speedy return of the patient to consciousness. *Per contra.* It cannot be used in all cases; is more expensive than

chloroform, and requires a special apparatus for administration. Apropos of this report, it is significant to note that the "Therapeutic Gazette," of Philadelphia, quotes from an article by Baldwin, in the "Interstate Medical Journal," as follows: "With these exceptions (pulmonary congestion and acute nephritis), which make its field a very limited one, nitrous-oxide oxygen should be looked on as the most dangerous anesthetic that can be used even in the hands of the most experienced." He adds that at the Johns Hopkins Hospital, where this mixed anesthetic was all the rage a few years ago, it has been gradually discontinued in favor of ether *per se*, and states that generally clinics which adopted nitrous-oxide oxygen are all beginning to revert to ether.—Pharm. J., 99 (1917), 125.

PHOSPHORUS.

Phosphorus.—*Discovery in Saxon Vogtland.*—Phosphorite nodules, a potential source of phosphorus, have been discovered near Ronnenburg, in Saxon Vogtland.—Chem. and Drug., 89 (1917), 484. (K. S. B.)

Phosphorus.—*The Dusart-Blondlot Toxicological Test for.*—In a "doctor thesis," H. J. Lemkes reports a careful study of Dusart-Blondlot method of detecting phosphorus by action of nascent hydrogen, with the production of phosphine, which can then be identified by several methods.

He finds purity of chemicals is the first consideration and purifies his samples of zinc by repeated fusion with a small amount (1 to 500) of metallic sodium. As to manipulation, he finds that the reflection of phosphorus compounds to phosphine is accelerated by heat; that the amount of zinc used is an important factor; that hypophosphites are more easily reduced than are phosphites. Trial of other reducing agents did not hasten the reduction, nor did the application of electrolysis nor of catalysers (platinic chloride copper sulphate, manganese, sulphate or tin chloride).

The sensitivity of the reaction depends upon the method of detection. In the phosphine flame, 0.00036 milligramme of calcium hypophosphite could be detected with the naked eye when the generating apparatus was kept warmed to 40°; while 0.05 milligramme of calcium phosphite was noted when the apparatus was at 40°; phosphine coloring the hydrogen flame a bluish green.

If the phosphine is passed through silver nitrate, a precipitate of Ag_3P is formed and if this precipitate is treated with nascent hydrogen, the minimum amount detected in the phosphine flame is 0.0025 milligramme of calcium hypophosphite. The precipitation as Ag_3P , prevents loss of phosphorus. It was found, however, that the silver compound decomposes easily, and that some of the phosphorus goes back into solution as phosphoric acid.

By observation of the hydrogen-phosphine flame through a spectroscope, 0.0036 milligramme of phosphorus as hypophosphite and 0.3 milligramme as phosphite could be detected as three green bands.

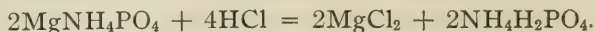
The article concludes with an account of experiments on the detection of phosphorus in decomposed bodies; the author finding the free element in the stomach of a rabbit that had been buried 97 days.—*J. pharm. chim.*, 15 (1917), 177.

Phosphoric Acid.—*Use in Lemonade.*—A commission, appointed to consider the question of the use of phosphoric acid for the purpose of acidulating lemonades and similar beverages, have condemned that practice. The grounds of this adverse opinion are that this acid is not burnt up in the body. They recommend lactic acid as a substitute for the more costly vegetable acids.—*Vierteljahr. ger. Med.*; through *Chem. Abstracts*, 11 (1917), 504.

Phosphoric Acid.—*In Soils.*—J. N. Sen found that the highly calcareous soils of Bihar, India, show low results in available phosphoric acid, when examined by the Dyer method. This method employs an extraction with 1 per cent. citric acid. The author contends that the low results found in these soils are caused by the interfering action of calcium carbonate. He has shown that the addition of calcium carbonate in amounts as low as 10 per cent. to a soil containing phosphates, reduced the available phosphoric acid from 0.312 to 0.009 per cent. The limit of the interference is placed at 20 per cent., for when larger quantities of calcium carbonate were added to such soils, no further diminution of the acid resulted. He also established the fact that the influence the calcium carbonate exerts is not altogether due to neutralization of the citric acid employed in the Dyer method.—*Agr. J., India*; through *C. U. C. P. Al. J.*, 24 (1917), 148.

Phosphoric Acid.—*Volumetric Assay with Magnesia Mixture.*—Bauzil suggests the assay of phosphates by precipitation with mag-

nesia mixture and titration of the suspended precipitate with tenth-normal hydrochloric acid, the titration reaction being



A solution containing not more than 0.1 gramme P_2O_5 is treated with 5 mls of magnesia mixture, and after one-half hour, the precipitated magnesium ammonium phosphate is collected in a filter, washed with two portions of 10 per cent. ammonia water and then with alcohol (10 to 15 mls) until it is free from alkali. The precipitate is then "spritzed" into a beaker with enough water to make about 60 mls and the suspension is then titrated with tenth-normal hydrochloric acid, 10 drops of helianthin solution (0.2 per cent.) being used as indicator. Each mil of tenth-normal acid represents 0.00355 gramme P_2O_5 .

The same method may be employed for the assay of *magnesia*, in such case, the magnesium solution is treated with phospho-ammoniacal reagent made of 200 grammes of crystalline di-sodic phosphate, 170 grammes of ammonium chloride, 260 mls of ammonia water and enough distilled water to make 1 liter. The resulting precipitate of magnesium ammonium phosphate is titrated exactly as described above. Each mil of tenth-normal acid used represents 0.002 gramme of MgO .

The paper also gives minute directions for assaying both phosphates and magnesium in a sample of urine.—J. pharm. chim., 16 (1917), 321.

Superphosphates.—*Criticized as Fertilizer.*—N. A. Barbieri strongly criticizes the employment of superphosphates as artificial manure. The whole of the phosphorus contained in plants is in the form of alkali or alkaline earth phosphates, and possibly combined with other mineral bases. When soluble and insoluble phosphates are eliminated, the plant contains no trace of any other phosphorus compounds. Phytins, consequently, are lacking. Plants do not absorb mono or dicalcium phosphates, known as superphosphates. These salts exert a retarding action on germination and on plant development. Cereals and leguminous plants grown in soil fertilized by means of superphosphates contain less total phosphorus than those from contiguous plots grown without superphosphates. Further, superphosphate destroys seeds when it comes into direct contact with them. When mineral fertilization is needed it is best to apply those substances which the plants themselves contain.—Gazz. chim. ital.; through Pharm. J., 99 (1917), 111.

BORON.

Boric Acid.—*Indicator in Titration of.*—B. H. St. John noted an unsatisfactory end-point in the determination of boric acid by titration in the presence of glycerol. He substituted methyl red and with some modification of the analytical method finds that it begins more satisfactory since a sharp end-point can be obtained and the results are more accurate.—*Am. J. Pharm.*, 89 (1917), 8. (R. P. F.)

Boric Acid.—*New Assay of.*—In describing his experiments on the detection of preservatives in caviar, O. Kopke reports on a method for estimating boric acid in food products originated by B. Pfijl. Ten grammes of the substance under examination are heated in a flask provided with a reflux condenser with 10 mls of fuming nitric acid until solution has taken place. After the addition of 50 mls of methyl alcohol and reversing the condenser the mixture is distilled and to the residue another 50 mls of methyl alcohol are added and distilled again. This operation is continued until the residue is free from boric acid. The combined distillates are neutralized and after the addition of 2.5 mls of N/2 caustic soda solution evaporated in a platinum dish to dryness, and the residue heated at low red heat. The residue is then dissolved in diluted hydrochloric acid, the solution mixed with 30 mls of a 40 per cent. solution of tri-sodium citrate and after the addition of one drop of a one per cent. phenolphthalein solution is neutralized. Sufficient mannite is then added to the liquid to obtain a 10 per cent. solution of the sugar and the solution is titrated with N/10 sodium hydroxide solution. Each mil of the latter corresponds to 6.2 Mg. of $B(OH)_3$ or 9.55 Mg. of $Na_4B_2O_7 \cdot 10H_2O$.—*Arb. Kais. Gesundhamt.*; through *Pharm. Weekblad*, 54 (1917), 166. (H. E.)

CARBON AND SILICON.

Animal Charcoal.—*As Wound Dressing.*—Animal charcoal containing 5 per cent. of iodine, recommended by Wiechowski for dressing wounds, retards granulation according to R. Springer. Better results are obtained by applying charcoal containing 10 per cent. of iodoform.—*Münch. med. Woch.*; through *Pharm. Weekblad*, 54 (1917), 1362. (H. E.)

Charcoal Absorptive Power of.—For the estimation of the absorptive power of charcoal generally methylene blue solution is used. Georg Joachimoglu found that this can more accurately be determined by shaking 200 Mg. of the powdered charcoal with 50 mls of N/10 iodine solution for 30 minutes, centrifuging the mixture and titrating back the excess of iodine in the liquid with sodium thiosulphate solution. Thus the amount of iodine absorbed by 100 Mg. of the coal is found. The iodine absorption factor of various brands of animal charcoal varied between 15.94 and 10.63. Beechwood charcoal had the factor 9.39, bone-black 7.69 and linden charcoal 4.85. It was found that iodine is absorbed by charcoal in the same proportion as are methylene blue and tetanus toxin. In connection with the results obtained by Friedrich with molasses charcoal, which contains 95 per cent. of carbon may be of interest. This coal had the same absorptive power as a good brand of blood coal.—*Biochem. Z.*; through *Pharm. Weekblad*, 54 (1917), 1173. (H. E.)

Blood Charcoal.—*Scarcity in England.*—Sydney W. Cole, of the Biochemical Laboratory in Cambridge, states that he is unable to find British sources of pure blood charcoal.—*Chem. and Drug.*, 89 (1917), 755. (K. S. B.)

Coal.—*Constitution.*—The constitution of coal is discussed by R. N. Wheeler in a paper in which he states that pyridine is the best solvent, dissolving about 40 per cent. Of this, about 30 to 40 per cent. is soluble in chloroform. Three classes of constituents are mentioned: (1) Residue insoluble in pyridine; (2) extract soluble in pyridine but insoluble in chloroform; (3) extract soluble in pyridine and chloroform or benzin. The first two are much alike in appearance and represent the cellulosic constituents. The third represents the resinic compounds.—*Chem. and Drug.*, 89 (1917), 54. (K. S. B.)

Coal.—*Methods of Studying.*—E. C. Jeffrey, in "Science Conspicuous," gives some interesting information regarding the origin and difference of composition of coal, obtained from various sources.—*Am. J. Pharm.*, 89 (1917), 268. (R. P. F.)

Silicon and Carbon.—*Comparison of Chemistry of.*—Stock, pointing out that about 500 silicon compounds are now known,

exclusive of the silicic acids, discusses the material under the headings of the following linkings: silicon with hydrogen, with carbon, with halogens, with nitrogen, with silicon and with oxygen and silicon. He then emphasizes the difference between silicon and carbon compounds. The affinity of carbon is about equally strong for positive and negative non-metallic elements, *e. g.*, H, O, S, N, Cl, C), there is an enormous difference between the positive and negative affinities of silicon. The four valencies in carbon are symmetrically distributed, but not in silicon.—Ber., 50 (1917), 171; through J. Chem. Soc. Abs. (A. V.)

Silica.—*Use in Nitric Acid Manufacturing Apparatus.*—Fused silica is now largely employed in the manufacture of condensers and conduit-pipes in nitric acid plants.—Chem. and Drug., 89 (1917), 852. (K. S. B.)

ALKALIES.

Potash.—*In Abyssinia.*—In 1911 an Italian resident of the Colonia Eritrea discovered an extensive deposit of potash salts and obtained a 35-year concession from the Abyssinian government. Its location is in a barren and waterless district about 46 miles inland from the little Red Sea settlement Fatimari. The potash deposit is large and resembles that of Stassfurt, Germany. Shortly after the outbreak of the war an Italian company was formed, which started active work employing 8000 men. The product was at first transported to the coast by camels, but now a railroad is being built. One of the members of the firm is the proprietor of a large chemical factory in Italy and agreed to take one thousand tons of potash per month the estimated total output of the mine) at a price of one thousand francs (\$193) per ton. The product is said to average not less than 55 per cent. K_2O .—Sc. Am., Sept. 29, 1917, 225. (O. R.)

Potash.—*American Production.*—More potash was produced in the first 6 months of 1917 than in the entire previous year, 14,000 short tons, valued at \$5,750,000, being sold. The Nebraska alkali lakes were the principal source. It is predicted that 25,000 tons, about $2\frac{1}{2}$ times the 1916 output, will be produced in 1917. This amount is about 10 per cent. of the normal consumption of the country before the war.—Chem. and Drug., 89 (1917), 1090. (K. S. B.)

Potash.—*In Banana Skins.*—R. H. Ellis has examined banana skins to ascertain if they are rich in potash. Analysis reveals the following facts: Moisture, 88.2; dried matter, 11.8; ash, 1.77; potash, 1.05; ash on dried matter, 15.00; potash on dried matter, 9.03; potash in ash, 57.16 per cent. Calculating on the bananas imported into this country, 7,112 tons of dried matter, containing 9 per cent. of potash, is available. The stalks yield 1,350 tons of dried matter containing 13.7 per cent. of potash, this being as rich as kainit in potash.—J. Soc. Chem. Ind.; through Am. Drug., 65 (1917), 111.

Potash.—*In Banana Stalks.*—Billing and Christie find that dried banana stalks contain as much potash as kainit, and compare favorably with dried kelp as a filler for commercial fertilizers. If charred and lixiviated 1 ton of the stalks readily yields 27 lbs. of potassium carbonate, containing 90 per cent. of K_2CO_3 . It is suggested that the collection and separate incineration of these stalks in large cities would prove remunerative.—J. Ind. Eng. Chem., 9 (1917), 153.

Potash.—*From Bracken.*—Concerning leaflet No. 39 by the Board of Agriculture for Scotland, Sir Herbert Maxwell states that some bracken sent him from Scotland had been examined in the Research Laboratories of the Pharmaceutical Society by Prof. Greenish. Greenish's report of the analysis is as follows:

The air-dried fern yields 4.82 per cent. of ash and of this 41.5 per cent. is K_2O . For practical purposes it may be assumed that 50 tons of dried fern would yield an ash containing one ton of potash. Prof. Greenish expresses his opinion as to the advantage of using bracken ash as a potash manure and as a means of cleaning the land from plague of bracken, which lessens the grazing capacity.—Pharm. J., 99 (1917), 153. (F. H.)

Potash.—*Production in Canada.*—Canada is now producing potash from feldspar, which yields 10 per cent. to 14 per cent. There are large deposits of feldspar available in Canada and the United States.—Chem. and Drug., 89 (1917), 859. (K. S. B.)

Potash.—*From Canadian Kelp.*—The American consul at Prince Rupert, British Columbia, reports that a potash plant has

been installed at Pacofi Cumshewa Inlet, Moresby Island, off the coast of British Columbia, the site of extensive kelp beds.—*Sc. Am.*, Nov. 3, 1917, 334. (O. R.)

Potash.—*In Cuba.*—It was recently claimed that extensive and very valuable deposits of potash salts had been discovered near Motembo, Cuba. Published analysis claimed that these deposits would yield up to 40 per cent. K_2O . Investigations conducted under authority of the Cuban Government would seem, however, to show that these claims were grossly exaggerated. Out of 13 samples examined none showed potash salts exceeding 0.51 per cent.—*C. U. C. P. Al. J.*, 24 (1917), 42. (G. C. D.)

Potash.—*From Kelp.*—J. W. Turrentine states that the giant kelps found on the Pacific Coast of the United States seem to hold out promise for the establishment of a domestic source for potash. One of the chief considerations is the economical harvesting of the kelp, and much progress has been made in this direction. It is found, however, that drying the harvested product presents a more difficult problem. Open air drying was found not to be practical, even in the dry climate of Southern California. Some artificial drying process will no doubt have to be employed, perhaps supplementing the open air process. Dry kelp is comparable in potash content with low-grade potash salts formerly imported. It is on the market in the form of a powder, weighing about 50 pounds per cubic foot, and yields about 15 per cent. of potash in the form of K_2O . Another problem is the elimination of the organic matter, so that the product may be sent to distant markets economically. Incineration must be carried on at a temperature below the fusing point of the potash salts, namely $750^{\circ}C$. Open air incineration does not meet the requirements, and it is proposed that the dry kelp be subjected to destructive distillation. In this manner it may be possible to recover other products which may prove of value. Kelp charcoal is very porous and readily leached. It is thought that the lower rates of transportation obtainable for potash salts will cover most, if not all, of the expenses of incineration.—*Met. and Chem. Eng.*; through *C. U. C. P. Al. J.*, 24 (1917), 130. (G. C. D.)

Potassium.—*German Production.*—During the years 1913, 1914, 1915 and 1916 the German Potash Syndicate produced respec-

tively, 11,103,695 double centners, 9,039,883 double centners, 6,797,522 double centners, and 8,839,759 double centners of potassium. The respective values were 191,000,000, 154,000,000, 106,000,000 and 155,000,000 marks.—Chem. and Drug., 89 (1917), 370. (K. S. B.)

Potash.—*Nebraska Production.*—The Potash Products Co., Hoffland, Neb., is shipping 1,500 tons of crude potash salts monthly obtaining it from the sand hill lakes.—Chem. and Drug., 89 (1917), 662. (K. S. B.)

Potash.—*Wyoming Production.*—A report published by the United States Geological Survey deals with the recovery of potash from wyomingite, a lava occurring extensively in the Leucite Hills of Wyoming, United States. The mineral is a silicate of alumina and potash, and far richer in potash than feldspar. Heating with calcium chloride at temperature not exceeding dull red heat rendered up to 73 per cent. of the potash soluble.—Pharm. J., 98 (1917), 346.

Potash.—*Waste of.*—The Bureau of Soils of the United States Department of Agriculture has made a good start on a survey and census of blast furnaces. It is found that there is an ample supply of potash in the country to meet all requirements of the United States. All that is necessary (says the report, a summary of which is published in the "Oil, Paint and Drug Reporter"), is to get the plants involved to put in the apparatus to collect it. The two main industries concerned are the cement and the blast-furnace plants. The census just completed of all cement mills producing more than 100 barrels a day has shown that bureau officials that for every barrel of cement produced in the United States there is more than two pounds of potash going up in smoke and being spread around in the form of dust from the smoke-stacks. It is claimed that an electrical precipitator, such as the Cottrell method, would collect more than 90 per cent. of this. Many of the cement mills are much interested, and four or five have installed the process. Others are deterred by the high price of steel and the cost of construction work generally. This is not merely a potash collection scheme. As things have stood for some time, most of the cement mills have been a real nuisance in their neighborhood, covering all of the surrounding territory with a white dust, partially clinkered clay and

lime. This electrical precipitation process collects this dust and abates the nuisance, and in addition, wherever installed, more efficient operation of the kiln resulted, and more cement is produced for the same amount of fuel—besides yielding a valuable by-product. In the same way in the blast-furnace industry the potash is not the main item. These furnaces produce a combustible gas, which is used in two or three different ways—to heat stoves with which to heat the air blast, to burn it under the steam boilers for power, and in many of them it is used in gas engines for power. That it may be used in this way it is necessary that it should be properly cleaned. The present means of cleaning are the use of dust-catchers and then primary washers, and then through a secondary set of washers. Of the original potash some is caught in the dust-catchers, but the bulk of it goes out in the waste water from the washers and out of the stack. In place of all that apparatus the electrical precipitator can be installed and the product at one end will be clean, dry, hot gas fit for the stoves or boilers, and at the other end dust containing a valuable percentage of potash. In the neighborhood of 100,000 tons of potash is coming from the cement mills. From the blast-furnaces is run between 250,000 and 500,000 tons of actual potash, K_2O . In the last normal year, 1913, the United States used in the neighborhood of 240,000 tons of potash. From this it is readily seen that there is a vast supply of potash going to waste which will be recovered as soon as the men in the industry convince themselves that they can effect a saving in operating costs and get a valuable by-product by using the electrical precipitator.—Pharm. J., 98 (1917), 459.

Potassium Compounds.—*Replacing with Sodium.*—F. J. Blumen-schein points out that while the substitution of sodium salts for those of potassium is permissible from a chemical standpoint in many cases from a physical standpoint, the salts of these two metals differ so that they cannot always replace each other. He gives an instance in making of pills of ferrous carbonate.—Proc. Penna. Pharm. Assoc., 40 (1917), 187. (J. K. T.)

Caustic Soda.—*Manufacture in the United States.*—It is estimated that between 1,500 and 1,800 tons of caustic soda is now being manufactured daily in the United States, most of it being produced electrolytically at Niagara Falls.—Chem. and Drug., 89 (1917), 964. (K. S. B.)

Potassium and Sodium Metabisulphites.—*Use as Preservatives.*
—P. Carles points out that for upwards of twenty years, potassium metabisulphite has found wide application as a preservative in œnology. For this purpose it has answered well. Being a well crystallized salt it has been obtainable in a fair degree of commercial purity. When kept from contact with air, it is stable, and does not readily lose sulphurous acid. When quite pure, it contains 57.6 per cent. of sulphur dioxide; as a rule, the commercial article yields from 52 to 54 per cent. Since the war, and the consequent scarcity of the potassium salt, considerable attention has been directed to the corresponding sodium salt. Since this is richer in sulphurous anhydride, containing, when pure, 67.2 per cent., it should, for many reasons, be preferable to the potassium salt. Unfortunately sodium metabisulphite does not readily crystallize. It is, therefore, met with in commerce in powder, or in compressed tablets. Hence it does not keep so well as the crystals of potassium metabisulphite. A more serious defect is the frequent presence of notable quantities of iron as an impurity in the sodium salt. Frequently samples are met with containing sufficient contamination with this metal to impart a distinct yellow color to the powder. This defect is specially harmful in the case of wines and in dietetic preparations in which color is an important item. When these contain tannin bodies, they ultimately develop a dark or even black shade when treated with the iron contaminated preservative. This undesirable result is not at once evident, since the sulphurous acid at first present keeps the iron in the ferrous condition. As, however, the reducing acid is volatilized or oxidized, so that the dark tint develops. It is, therefore, very necessary to be assured that all sodium metabisulphite used as a preservative is reasonably free from iron.—Rep. Pharm.; through Pharm. J., 98 (1917), 161.

Potassium Permanganate.—*Synonym.*—The Metropolitan Chemists Association of Melbourne has adopted "Purple Crystals" as the synonym for potassium permanganate.—Chem. and Drug., 89 (1917), 980. (K. S. B.)

Potassium and Sodium Sulphates.—*Assay with Platinic Chloride.*
—Mlle. B. Turkus proposed a simplified modification of Tinkeuer's method. The alkali sulphates, in acid solution, are converted directly into chloroplatinates, without eliminating the sulphuric

radical. The potassium platinochloride is then separated from the sodium compound by means of alcohol, and decomposed by calcination. A weighed amount of the mixed sulphates dissolved in water is treated with a calculated quantity of platinic chloride solution, assuming the whole of the alkali present as being sodium sulphate, and allowing 50 per cent. of the reagent in excess of this. A few drops of hydrochloric acid are added, and the mixture is evaporated to dryness to eliminate as much as possible of the free acid. The residue is taken up in alcohol 85 per cent., to which a drop of ether has been added. Sodium platinochloride is dissolved, leaving the potassium compound insoluble. This residue is washed several times with alcohol 85 per cent. before being transferred to the filter. This is not done until the washings are colorless. It is then calcined, gently at first, then at a red heat until white fumes of potassium chloride are no longer given off. The residue, after cooling, is then washed with water until the washings give no reaction for sulphates or chlorides. The washed platinum is then treated in the crucible with a few drops of dilute hydrochloric acid. The crucible and its contents are placed in a beaker containing water, and heated on the water-bath for fifteen minutes. This water is rejected, and the washing is repeated until the platinum is pure, and the washings cease to react with silver nitrate. The crucible and contents are then dried, heated, cooled, and weighed as platinum. From the weight thus obtained the amount of potassium is calculated. The sodium present is determined by difference. The results are fairly accurate, and the method is specially applicable to the determination of the two alkalies in silicates.—Ann. chim. anal.; through Pharm. J., 99 (1917), 145.

Sodium Bicarbonate.—*Incompatibilities of.*—Following up the subject broached by Astruc and Cambe, who directed attention to the incompatibility between sodium bicarbonate and bismuth, magnesium, and lithium benzoates and salicylates, E. Canals cites a number of other salts and compounds with which sodium bicarbonate causes chemical action, with evolution of more or less carbonic acid gas. Commencing with the obvious incompatibility of sodium bicarbonate with acetylsalicylic acid, other less generally recognized instances are given. These are the liberation of the gas from the bicarbonate by the acetates of bismuth, magnesium, lead, and zinc; and a very slight reaction with lithium acetate. Heroine or diacetylmorphine, and tannigen, or diacetyltannin, also cause

carbon dioxide to be given off in small quantity, probably on account of the instability of their molecular structure. Except in the case of acetylsalicylic acid, the pharmacist may obviate the difficulty in dispensing by substituting the equivalent of the normal carbonate for the quantity of bicarbonate prescribed.—*J. pharm. chim.*; through *Pharm. J.*, 98 (1917), 257.

Sodium Chloride.—*In Wound Treatment.*—Salzman gives an account of a suppurating compound fracture treated with unexpected success by salt solution. The patient was a young man who had received a number of fractures by a fall. All healed kindly except in the fore-arm, where an extensive osteomyelitis developed, the predominant organism being the *Bacillus pyocyaneus*. The discharge was so profuse and foul that a continuous flow of very weak permanganate solution was used to deodorize it. After twenty-four hours it was discontinued, but the patient asked for it again, as he thought it did him good. The bath was renewed, but strong salt solution substituted for the permanganate. It was discontinued again forty-eight hours later on account of the tense and swollen condition of the limb. The next day, however, the author was surprised to find very little pus on the dressing, and the improvement continued so that at the end of the week the wound was clean and granulating. He does not hesitate to say that the arm would have soon been sacrificed but for the wonderful effect of the continuous bath.—*Drug. Circ.*, 61 (1917), 74.

Chilian Saltpetre.—*Production.*—In 1916 Chile produced 2,878,000 tons of saltpetre, which is 120,000 tons more than the highest previous production (in 1913). The United States took 1,200,000 tons of this.—*Chem. and Drug.*, 89 (1917), 662. (K. S. B.)

Sodium Nitrate.—*Production in Chile.*—Hobsbaum and Grigiani, in a paper presented at a meeting of the London section of the Society of Chemical Industry, reviewed the sodium nitrate production of Chile. With the lixivation system now in use, raw material could be economically worked with about 30 per cent. nitrate content. A plant, erected in 1884, produced about 6,000 tons of sodium nitrate per month, and for every ton of coal burned twelve tons of nitrate were manufactured. So stationary the industry

had been from that time onwards that in 1914 there had been no improvement in the production, with the exception of mechanical labor-saving devices, such as elevators. The improvements made between 1900 and 1915 were illustrated by a detailed account of one of the latest works designed, in 1911, for a monthly output of 90,000 quintals, but an examination of the working figures showed that the tons of nitrate produced per ton of coal had fallen from 12 to 1 to 5.3 to 1. This, however, was due to the fact that in this later plant caliche of a much lower grade was being used; a nitrate which could not have been treated at all by the plant erected in 1884. Following this was an outline of various attempts—more or less spasmodic and unorganized—to improve the present system; attempts which had all broken down from the fact that they were not of a sufficiently radical nature, but simply attempts to palliate existing evils in the present plan. Two processes were described which had been extensively worked out and tested by continuous experiments and sustained research until they could now be looked upon as practical propositions, namely, the “Butters” process and the “Gibbs” process. The authors referring to the statement, so often made, that the nitrate grounds of Chile were practically exhausted, or would be so within a few years, say that according to the official returns, there was a sufficient supply to last for at least one hundred more years. There was, in fact, according to a report by the authorities in Chile, 245,300,000 tons of nitrate awaiting treatment by some economical process.—*Drug. Circ.*, 61 (1917), 132.

Sodium Phosphite.—*Manufacture of.*—G. A. Linhart makes this salt, now used as an antidote for mercuric chloride, as follows: In the preparation of pure phosphorus acid, phosphorus trichloride is introduced into a separatory funnel provided with a groove in the ground-glass stopper for the admission of air, which permits the phosphorus trichloride to flow out into a round bottom flask containing water. The rate of flow is so adjusted that there are never more than a few drops of phosphorus trichloride at the bottom of the flask. A steady current of carbon dioxide gas is passed into the flask to prevent oxidation of the phosphorus acid by air. The gases are led off from the flask through a wash bottle. The suction must be just sufficient to prevent fuming. After the desired amount of phosphorus trichloride has been allowed to react with the water in the flask, the flask is placed on a water-bath and later

this is replaced by a paraffin bath and the contents of the flask gradually heated to 180° . This temperature is maintained until the last traces of hydrochloric acid are expelled. The flask is then allowed to cool down to about 80° which is the melting point of phosphorous acid; during the cooling the current of carbon dioxide is continued. The liquid acid is then poured into any desired form and allowed to solidify. The acid obtained by this process is chiefly metaphosphorous acid, HPO_2 , the rest being normal phosphorous acid, H_3PO_3 . To prepare sodium phosphite from the pure solid phosphorous acid and pure sodium bicarbonate, the compounds should be used in the ratio of 1 part acid to 4 of bicarbonate, and the two dissolved in sufficient water to make a 10 per cent. solution. If the solution thus prepared is to be used for intravenous injections, it must be sterilized by filtration, and not by heating, as the sodium bicarbonate decomposes at about 47° .—J. Lab. Clin. Med.; through Chem. Abstracts, 11 (1917), 2527.

Lithium Carbonate.—*Detection of Magnesium Carbonate on.*—The German Pharmacopœia directs that when lithium carbonate is dissolved in hydrochloric acid, the solution neutralized with ammonia water and then mixed with sodium phosphate solution no opalescence nor precipitate should be produced. G. Frerichs found that by this reaction reliable results are not always obtained, since the accuracy depends too much on the amount of ammonium chloride present. He therefore recommends boiling one gramme of lithium carbonate with 150 mls of water by which a clear solution should result. The presence of one per cent. of magnesium carbonate produces a turbidity. Or, one gramme of lithium carbonate is dissolved in 10 mls of diluted hydrochloric acid, the solution is boiled to expel the carbonic acid and after cooling is mixed with 5 mls of 15 per cent. caustic soda solution. No turbidity should be produced.—Apoth. Zeit.; through Pharm. Weekblad, 54 (1917), 766. (H. E.)

CALCIUM AND BARIUM.

Calcium.—*Detection in the Presence of Barium and Strontium.*—Kohlrausch found that strontium fluoride is about 8 times and barium fluoride about 100 times more soluble than calcium fluoride. On these properties of the alkaline earths, Karavglanow has based a method for detecting calcium. When to 5 mls of diluted barium

fluoride solution one-tenth its volume of the liquid under examination is added, a precipitate will be formed when as little as $\frac{1}{20}$ Mg. of calcium is present. The barium fluoride solution is prepared from hydrofluoric acid and barium hydroxide or by double decomposition of barium chloride and ammonium fluoride. The sensitiveness of the reaction is decreased when the quantity of barium is great in proportion to that of calcium. Strontium does not interfere with the reaction.—Z. anal. Chem.; through Pharm. Weekblad, 54 (1917), 1358. (H. E.)

Calcium.—*Determination as Calcium Sulphate.*—Because of the hygroscopic properties of calcium oxide obtained by the ignition of the oxalate, the ignited precipitate is frequently converted to sulphate by treatment with sulphuric acid and further ignition, which may result in the loss of SO_2 if too high a temperature is reached. The conversion of oxide carbonate to sulphate may be easily effected according to Willis and MacIntire by adding for each 0.2 gramme of carbonate present, sufficient of an equimolecular mixture of ammonium sulphate and chloride to give an excess of approximately 0.3 gramme of the sulphate. By gentle ignition, the salts are volatilized, when pure calcium sulphate will be left in the crucible.—J. Ind. Eng. Chem., 9 (1917), 1114. (G. D. B.)

Calcium.—*Volumetric Assay of.*—Grosfeld precipitates calcium with a known amount of ammonium oxalate from a solution slightly acidified with phosphoric acid. After filtration of the calcium oxalate through a "Kieselguhr filter paper," the excess of ammonium oxalate is titrated in an aliquot portion of the filtrate with potassium permanganate.—Chem. Ztg., 41 (1917), 842; through J. Chem. Soc. Abs. (A. V.)

Calcium.—*Detection in the Presence of Strontium and Barium.*—P. N. Raikow found that when the alkaline earths in a mixture are precipitated as carbonates and these are heated at red heat in an open porcelain crucible only the calcium carbonate is converted into oxide while barium carbonate and strontium carbonate remain unchanged. On adding water to the cooled mixture and filtering, a filtrate is obtained which has an alkaline reaction when calcium is present in the mixture.—Chem. Ztg.; through Pharm. Weekblad, 54 (1917), 720. (H. E.)

Calcium Carbonates.—*Existence of Basic.*—Donath and Lang mention that calcium carbonate, after contact with water and lime, becomes hardened, due to a fixation of part of the lime and suggest that probably basic calcium carbonates are formed.—Oesterr. Chem. Ztg., 25 (1917), 175; through J. Chem. Soc. Abs. (A. V.)

Calcium Carbonate.—*Medicinal.*—A. Berthelot points out that great importance attaches to the physical condition of precipitated chalk used for medicine. When the precipitation is performed in the cold, at about 0°C. , a light, hydrated carbonate having a density of 1.7 is obtained. This will show only a few crystalline grains under a high magnification. If precipitation is conducted at about 30°C. , the product will consist of minute rhombohedra, and have a density of 2.7. If boiling solutions are employed, the precipitate will be formed of prismatic rhombohedra and have a density of 2.9. Since the denser form is easy to manipulate and wash, most of the precipitated calcium carbonate of commerce is of this variety. Although this may answer all official tests it is by no means suitable for medicinal use, since it is much less readily attacked by acids, and a considerable portion will pass through the intestines unacted on by the acid secretions. When calcium carbonate is prescribed the form precipitated in the cold should be specified. This form alone should receive official recognition in future pharmacopœias.—J. pharm. chim., 16 (1917), 57.

Calcium Cyanide.—*Canadian Production.*—The Canadian production of calcium cyanide is now about 43,000 Cwt. annually, and is steadily increasing.—Chem. and Drug., 89 (1917), 303. (K. S. B.)

Barium.—*Determination as Sulphate.*—Karavglanow points out that in the estimation of barium too low results are obtained, if nitric acid or large amounts of hydrochloric acid are present and too high results in the presence of potassium salts and ferric chloride. The errors are not so great in the determination of barium as in that of sulphuric acid.—Z. anal. chem., 56 (1917), 487; through J. Chem. Soc. Abs. (A. V.)

RADIUM AND RADIO-ACTIVITY.

Radium.—*Use in Cancer.*—At the annual meeting of the Christie Hospital, Manchester, it was reported, says the "British Medical

Journal," that twenty-seven cancer patients had been admitted to that institution for radium treatment. Sir H. Miers stated that the progress made in the study of cancer during recent years induced some hope that we were standing on the brink of discoveries which would lead to cure, and the step from cure to prevention might be but a short one. Professor Wild considered that it was, as yet, too early to draw any dogmatic conclusions from the cases which had been treated with radium. It would be necessary to wait for years to see whether the good results obtained were permanent. Dr. Burrows reported that he had had two inoperable cases under radium treatment, and the patients were apparently now quite well. These two cases represented only eight per cent. of last year's total twenty-two treated, which was but a small percentage. It must be remembered however, that they were cases which formerly would have been necessarily left to die.—Pharm. J., 98 (1917), 65.

X-Ray Screens.—*Increase of Sensitiveness.*—T. Thorne Baker says that the sensitiveness of the intensifying screens using radiography is likely to be increased by 200 to 300 per cent. Methods have been evolved whereby the size of the crystals can be controlled so that the grain is no larger than that of the photographic plate.—Chem. and Drug., 89 (1917), 376. (K. S. B.)

X-Ray Work.—*Pharmacists Performing.*—In a discussion by C. T. Allen, of the possibilities in this field for the practising pharmacist in the smaller cities and towns where physicians have difficulty in securing this service. The writer divides the work into three classes. Elementary radiography deals with the localization of foreign bodies and bone examinations. Advanced X-ray work is concerned with examinations of the heart, lungs, intestines and kidneys. X-ray therapeutics comprises the uses of this agent in the treatment of disease. The advanced and therapeutic manipulations are within the domain of the specialist rather than the pharmacist. The ordinary medical or dental practitioner, while realizing the importance of X-ray work, is not justified in purchasing and maintaining the complicated and expensive apparatus required for radiography. His practice does not demand the every-day use of this equipment but there are numerous occasions when he desires this service and the pharmacist working in conjunction with a circle of medical men would have an opportunity

of building up a remunerative practice. The article includes a brief consideration of the necessary apparatus and other essentials for success in radiography.—*Pharm. Jour.*, 98 (1917), 157. (C. W. B.)

Thorium Salts.—*Use in Pyelography.*—J. Edward Burns, uses both 10 and 15 per cent. solutions of the double citrate of thorium and sodium. The 15 per cent. solution represents approximately 15 per cent. of thorium nitrate, about 9 per cent. of sodium nitrate, and 21 per cent. of sodium citrate, the thorium being probably in the form of a double citrate of thorium and sodium, and not occurring as the nitrate. (See Year Book, 1916, 144.) He claims that a properly prepared solution is not toxic, it is perfectly clean and does not stain the linen, and is quite inexpensive, being about one-third as costly as collargol.—*J. Am. Med. Assoc.*, 68 (1917), 533. (W. A. P.)

COPPER.

Copper.—*Deposits in Newfoundland.*—Extensive copper deposits have been found at Little Bay, about 200 miles north of St. John's. The metal-containing veins are numerous, and contain nearly pure cupro-pyrites, yielding as much as 29.5 per cent. of pure metallic copper.—*U. S. Commerce Rep.*; through *C. U. C. P. Al. J.*, 26 (1917), 45. (G. C. D.)

Copper.—*Reaction of.*—Mayer and Schramm report on a reaction of copper which depends on the formation of a dark colored copper peroxide when a copper solution is treated in the presence of sodium bicarbonate with hydrogen dioxide solution. The liquid under examination (100 mls) is mixed with 10 mls of a N/10 sodium bicarbonate solution and 10 mls of a 30 per cent. hydrogen dioxide solution. In the presence of an appreciable quantity of copper, a light green color is formed and a red-brown precipitate settles after allowing the mixture to stand for some time. In very diluted solutions the mixture acquires a red-brown and in the presence of only traces of copper a yellow tint. It is claimed that by the reaction which is as sensitive as Winkler's sodium bicarbonate and potassium ferrocyanide reaction, as little as one milligramme of copper in 3 liters of liquid can be detected. Unfortunately this reaction is not specific for copper and is given by

iron, manganese, nickel, cobalt and lead also. The author recommends it therefor for detecting heavy metals in water especially in distilled water to be used for dissolving salvarsan.—*Zeitsch. anal. Chem.*; through *Pharm. Weekblad*, 54 (1917), 1358. (H. E.)

Copper Sulphate.—*As an Algæcide.*—G. Embrey recommends 1 part of copper sulphate per 3 million parts of water to destroy algal growth in reservoirs and to keep the water free from weeds, without having any injurious effect on fishes. The *modus operandi* is to place the copper sulphate into a perforated copper tank, attached to the stern of a boat, so that the solution of the salt circulates as the boat passes through the water. At first the number of bacteria increases, owing to the decomposition of the algæ, but then rapidly decreases.—*The Analyst*; through *Sc. Am. Suppl.*, No. 2187, Dec. 1, 1917, 341. (O. R.)

Copper Sulphate.—*Japanese Export.*—The Japanese exports of copper sulphate, a new item from Japan, were 215 tons in January and February, 1917.—*Chem. and Drug.*, 89 (1917), 582. (K. S. B.)

SILVER.

Colloidal Silver Injections.—*Effect on Wassermann's Reaction.*—C. Picado finds that intravenous injections of colloidal silver affect Wassermann's reaction in certain cases, either by re-activation, or by inhibition. They may even cause a positive reaction to be obtained with normal subjects. It becomes necessary, therefore, to avoid error of diagnosis, to apply Wassermann's reaction only to patients who have not been subject to recent medical treatment with collargol, or possibly with other therapeutic agents.—*J. pharm. chim.*, 15 (1917), 361.

Silver-Gelatin Preparations.—Van Veimarn, Anosov and Morozov, find that colloidal silver with dextrin and glue form solutions that are permanent even after 12 to 15 months. Similar preparations made with gelatin form very stable solutions.—*J. Russ. Phys. Chem. Proc.*; through *Chem. Abstracts*, 11 (1917), 3380.

GOLD.

The Colloidal Gold Test.—J. H. Black and Louis Rosenberg report an extensive series of experiments carried out to determine the best method for the preparation of the colloidal gold solution used in the diagnosis of diseases of the central nervous system, and the methods of applying the test. The authors also formulate the chemical reactions that take place during the preparation of the test solution. While the complicated procedure proposed by previous investigators has been materially simplified, the original must be consulted for the method finally adopted.—J. Am. Med. Assoc., 69 (1917), 1855. (W. A. P.)

MAGNESIUM.

Magnesium.—*Rapid Method of Assaying.*—N. Busvold gives the following method for determining magnesium in limestone: Five to ten grammes of the limestone are heated to red heat in an electric oven, dissolved in a small amount of hydrochloric acid (1 : 2), the solution heated to boiling and after the addition of an excess of pure calcium carbonate the boiling is continued for a few minutes. The mixture is then filtered, the precipitate washed with water and filtrate and wash-water are heated with 20 mls of 6 per cent. milk of lime. After cooling, the mixture is filtered, the filter washed with lime water and precipitate and filter are transferred to an Erlenmeyer flask of one-liter contents. There are then added 300 mls of water and 40 mls of normal oxalic acid and the contents of the flask is boiled for five minutes (or until the calcium is converted into oxalate), then filtered and the filter washed well with boiling water. The filtrate is then cooled and titrated with N/5 caustic soda solution, using methyl red as an indicator, after which 25 mls of sulphuric acid (1 : 6) are added, the mixture is heated at 70° C. and titrated with N/10 potassium permanganate solution. Each mil of N/5 oxalic acid consumed corresponds to 0.004306 Gm. of magnesium oxide.

By boiling with calcium carbonate the metals of the third group, with the exception of magnesium, are precipitated. In the filtrate which contains calcium chloride and magnesium chloride the magnesium is precipitated by the calcium hydroxide. By boiling with oxalic acid the magnesium hydroxide goes in solution and the calcium remains on the filter as oxalate. By titrating with caustic

soda the oxalic acid not combined with magnesium is determined while by the titration with permanganate the total amount of oxalic acid is estimated. The difference between the two is the amount of oxalic acid combined with the magnesium. From this the percentage of magnesium can easily be calculated.—*Chem. Zeit.*; through *Pharm. Weekblad*, 54 (1917), 533. (H. E.)

Calcined Magnesium.—*Tests for Purity.*—A. Astruc criticizes the monograph for this chemical given in the Codex. He believes that the tests should include not merely loss of weight on heating to 100° (water) but also loss of weight on calcination (presence of carbonate). On the other hand, his experiments show that testing for calcium compounds by addition of oxalic acid is only fair when the exact condition of dilution, the strength of the acid solution and the time of observation are positively stated; otherwise the observer may mistake the separation of magnesium oxalate for the supposed precipitate of calcium oxalate.

Astruc tabulates the results of the examination of 26 samples of calcined magnesia obtained by him from 26 different sources and shows that none of these come up to the requirements of the Codex. He believes however, that this condition is largely due to wording of the tests of the Codex, in which he believes there should be stated the limits of soluble salts, carbonates, calcium and water of hydration as obtains in U. S. P. IX.—*J. pharm. chim.*, 16 (1917), 65 and 110.

Epsom Salt.—*Flavored.*—When a physician prescribes a dose of Epsom salt to be taken in one of the official aromatic waters, he does not create a new invention. Yet the U. S. Patent Office has granted a patent for the "discovery" of a method for flavoring Epsom salt.—*J. Am. Med. Assoc.*, 68 (1917), 1914. (W. H. P.)

Talcum.—The Swedish Pharmacopœia describes talcum as a powder which is insoluble in water and acids. An examination of 15 samples of commercial talcum showed that 8 samples were soluble in acids to an extent of from 1.3 to 3.0 per cent., 3 samples, 3.7 to 4 per cent., and some samples contained as much as 5.5, 8.0, 15.0 and even 30 per cent. of acid-soluble matter which consisted chiefly as calcium carbonate. It is therefore recommended to insert the following test into the Pharmacopœia: When 5 grammes of

talcum are boiled with 25 mils of N/1 hydrochloric acid, not less than 22 mils of N/1 caustic potash solution should be used for titrating the excess of the acid.—Farm. Rev.; through Pharm. Weekblad, 54 (1917), 1172. (H. E.)

ZINC.

Zinc Oxide.—*Lead in.*—Charles H. LaWall states that in many samples of zinc oxide, lead is present to the amount of from 0.1 to 0.5 per cent. and advises the rejection of all samples labelled "U. S. P. in all respects except the heavy metal test." He suggests the following methods for examination: Dissolve 5 grammes of the sample of zinc oxide in a slight excess of diluted sulphuric acid, with gentle heat; collect and wash the precipitate with distilled water; then pour through the filter containing the precipitate a concentrated solution of ammonium acetate (about 25 per cent.) freshly made, and to this filtrate which now contains the lead in a soluble form add a slight excess of solution of potassium chromate which will precipitate insoluble lead chromate which may be collected on counterpoised filters, or on a Gooch crucible mat, washed, dried, weighed and calculated as to its percentage. A more expeditious method which gives good results with the amount of lead usually found at the present time is to simply dissolve 5 or 10 grammes of the sample of an excess of acetic acid and then perform the precipitation with potassium chromate in this solution directly, and collect, wash and weigh the precipitate as before. This latter modification will give low results, however, where part of the lead is present in the form of sulphate as is often the case, as the sulphate will remain behind when the solution is made in acetic acid.—Proc. N. J. Pharm. Assoc., 47 (1917), 74. (J. H.)

Zinc Perhydrate.—Sjöström finds that when hydrogen dioxide acts on zinc oxide or zinc hydroxide, perhydrates such as HOZnOOH and HOZnOZnOOH are formed. To prepare zinc perhydrate, 100 grammes of previously ignited zinc oxide are cautiously added to an ice-cooled mixture of 300 grammes of water and 200 grammes of 15 per cent. hydrogen dioxide. Place the mixture at once into a large flask, shake occasionally and let stand 24 hours. Drain off the liquid and dry the mass at 40° on unglazed porcelain.—Farm. Revy.; through Chem. Abstracts, 11 (1917), 2532.

Zinc Salts.—*Volumetric Assay.*—Sjöström points out that the amount of zinc in a solution of chloride, sulphate or nitrate, even when the acid is in excess, may be learned by two simple volumetric assays. The zinc solution is treated with potassium iodide-iodate reagent and the freed iodine is titrated with tenth-normal thio-sulphate V. S. The amount of thiosulphate used, the amount of free acid may be deduced.

Another sample of the zinc solution is mixed in a 250 mil flask with 25 mils of normal sodium hydroxide (free from carbonate), 5 mils of 30 per cent. *neutral* hydrogen dioxide solution and water to make 250 mils. The zinc will be precipitated as peroxide and the acid that has been in combination with the zinc will neutralize some of the sodium hydroxide V. S. The mixture is filtered and an aliquot part (50 mils) is titrated with tenth-normal acid, dimethylamidoazobenzene being used as indicator. From the amount of tenth-normal acid needed the amount of total acid in the original zinc solution can be deduced and if from this figure, the amount of free acid is subtracted, the amount of acid combined with the zinc can be calculated, as well as the amount of the metal itself.—Farm. Revy.; through J. Pharm. chim., 15 (1917), 350.

Zinc Sulphide.—*Phosphorescent.*—There is quite an extensive literature on this subject, but not much agreement as to the facts. The latest contribution to these statistics is published in the August 1917 number of the Transactions of the Chemical Society, and clearly brings out one of the reasons to account for contradictory statements and positively help us on in other ways. Most of the various investigators did not sufficiently define the exact conditions under which they worked, and those conditions, especially of temperature, are very important factors. The new research has been conducted at the University of Glasgow and for further particulars the original paper should be consulted.—Sc. Am. Suppl. No. 2185, Nov. 17, 1917, 309. (O. R.)

MERCURY.

Mercury.—*Absorption in the Inunction Treatment.*—Udo J. Wile and Joseph A. Elliott conclude that (a) The mode of absorption of mercury in the inunction cure is both by volatilization and by direct absorption through the skin; (b) non-volatile salts of mercury are absorbed through the skin, but their elimination and their absorption are far slower than is the absorption of

those salts having a high vapor pressure; (c) the more rapid appearance of mercury in the urine in the case of the volatile salts is probably due to the combined action of volatilization and inhalation through the lungs and absorption through skin; (d) in the order of rapidity of absorption, mercurial ointment ranks over calomel, although the latter is appreciably absorbed through volatilization; (e) as the therapeutic effect of mercury is probably in proportion to the rapidity and degree of absorption, there can be no question that the volatile salts should not be superseded in the inunction cure by the non-volatile salts, even though the latter have the advantage of cleanliness; (f) as calomel is obviously a cleaner preparation, and further, as it is absorbed both by volatilization and directly through the skin, further study should be undertaken to determine whether its therapeutic effect may not justify its substitution for mercurial ointment.—J. Am. Pharm. Assoc., 68 (1917), 1024. (W. A. P.)

Mercury.—*American Production.*—California produced 21,400 flasks of 75 lbs. each of mercury in 1916, which sold for \$2,000,900.—Chem. and Drug., 89 (1917), 662. (K. S. B.)

Mercury.—*Assay in Organic Compounds.*—Marsh and Lye at a meeting of the Society of Chemical Analysts described a modification of the method of estimating mercury in organic compounds by combination with quicklime, by means of which the mercury is separated as a single globule without admixture of any tarry or crystallizable distillate, such as is sometimes obtained with aromatic derivatives.—Chem. News, 115 (1917), 95.

Mercury.—*Assay in Organic Compounds.*—Lemhalt and Christiansen discuss in detail the procedure to be followed: 1. The destruction of organic matter is carried out by potassium permanganate in the presence of sulphuric acid if urine is to be examined, and if feces or organs are present, a preliminary destruction with nitric acid is first used. II. In the precipitation with hydrogen sulphide, copper sulphate is first added to increase the bulk of the precipitate. III. For filtration of the sulphide a special form of filter funnel is described. IV. The sulphide is dissolved in nitric and hydrochloric acids. V. The mercury is deposited on a small, gold electrode in an electrolysis apparatus, which is described. VI.

The gold electrode, when only small amounts of mercury are present, is weighed on a Nernst microbalance.—*Biochem. Z.*, 81 (1917), 356; through *J. Chem. Soc. Abs.* (A. V.)

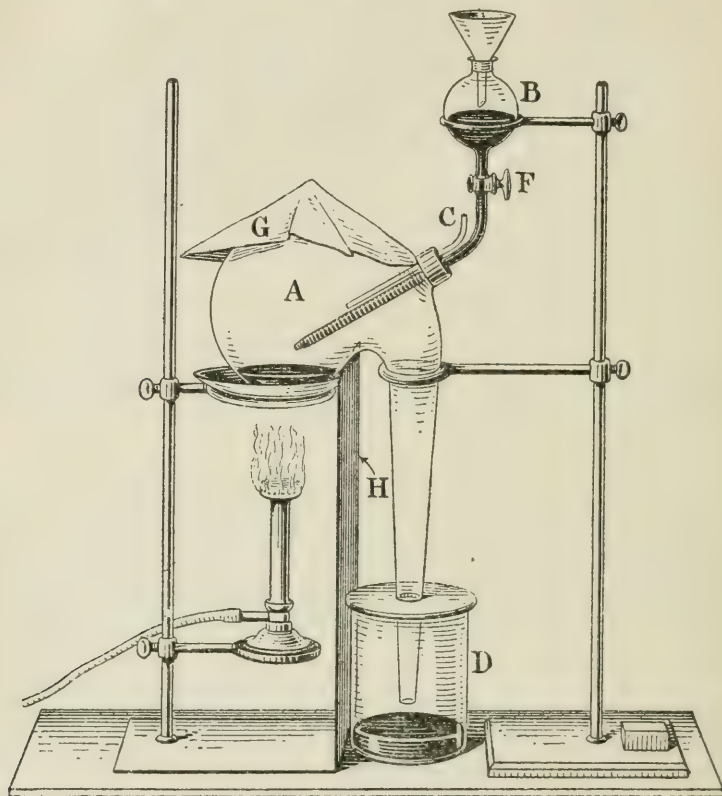
Mercury.—*Assay in Pharmaceuticals.*—H. Wastensen has devised the following method, which has the advantage of obviating the tedious steps of removing the fat by extraction. It is not applicable to salves containing paraffins. One gramme of the sample is digested with concentrated sulphuric acid in a Kjeldahl flask, adding concentrated nitric acid from time to time until the organic matter is destroyed and the solution is clear or only very slightly colored. The nitric acid must be free from chlorine. Water is added and boiled off. Water is again added to keep the mercuric sulphate in solution and then a solution of potassium permanganate is poured in until the liquid is distinctly red. The red color is removed with a solution of ferrous sulphate and the contents of the flask are transferred to a casserole and diluted to about 100 mls. Five mls of ferric alum solution are added as indicator and the fluid is titrated with tenth-normal ammonium thiocyanate.—*Svensk. Farm. Tid.*; through *Chem. Abstracts*, 11 (1917), 1258.

Mercury.—*Detection of.*—Joseph A. Elliott, describes in detail the method whereby as small an amount as 1 millionth of a grain of mercury can be detected in 500 mls of water by depositing the mercury on a gold leaf.—*J. Am. Med. Assoc.*, 68 (1917), 1693. (W. A. P.)

Mercury.—*Detection of Traces for Toxicological Purposes.*—Traces of mercury salts are detected by K. C. Browning in the following manner: Electrolyze the solution, using a small strip of pure gold as the cathode, and a strong current. The mercury collects upon the gold, is washed with water (ether removes some mercury) and dropped into the hot limb of a Duprez tube. The tube is evacuated suddenly and a spark passed, when the mercury is detected by its spectrum, even in presence of only one part in a thousand millions. Much mercury is lost by volatilization in the usual method of concentrating liquids with addition of hydrochloric acid and potassium chlorate.—*Chem. and Drug.*, 89 (1917), 469. (K. S. B.)

Mercury.—*Purification of.*—H. B. Dunnicliff describes the apparatus for distilling mercury illustrated below (Fig. 14): with which he was able to purify some 50 pounds of dirty mercury retort (capacity not stated); B is a separatory funnel with exit tube bent at the proper angle; C is an ordinary bent glass tube, presum-

Fig. 14.



Mercury Purification.

ably (though not stated) to equalize pressure; D is the beaker used as container for the distilled mercury; G and H are pieces of asbestos sheeting. The author states he can with the apparatus distil an ounce of mercury in four minutes.—*Chem. News*, 116 (1917), 41.

Mercury.—*Production in Spain.*—The production of mercury in Spain in 1915 was 20,717 tons, an increase of 3,003 tons over 1914. Seventeen concessions were worked by 1,334 men. The famous

Almaden mine, in the Province of Cuidad Real, produced 10,094 tons, a decrease of 1,062 tons from 1914, but this loss was offset by the increased production of the two Granada mines, which yielded 2,470 tons, and of the 14 Oviedo mines, which yielded 8,153 tons. The production in Spain during the last 5 years for ore and commercial mercury expressed in metric tons was as follows: 1911, 19,940 and 1,494; 1912, 21,889 and 1,256; 1913, 19,960 and 1,246; 1914, 17,714 and 953; 1915, 20,717 and 1,222.—Chem. and Drug., 89 (1917), 765. (K. S. B.)

Mercury Benzoate and Calomel.—*Painless Injections of.*—Jacquod suggests the following manipulation:

Mercuric benzoate, which is used on a considerable scale in France for the mercurial treatment of syphilis, requires careful preparation. It may best be obtained by the double decomposition of mercuric acetate and sodium benzoate. Ten Gm. of yellow mercuric oxide is dissolved in the cold in 8 Gm. of glacial acetic acid previously diluted with 100 mls of distilled water. This solution is poured, with constant agitation, into a solution of sodium benzoate, 18 Gm. in water, 300 mls. The copious white precipitate of mercuric benzoate thus obtained is washed on a filter with water, until free from acid. It is then dissolved in a solution of sodium chloride, 6 Gm. in water, 500 mls, by adding this in a thin stream to the precipitate on the filter. To obtain a solution containing 0.02 Gm. of mercuric benzoate in 1 mil. the filtrate thus obtained is adjusted to the volume of 1,065 mls with distilled water; if a dosage of 0.03 Gm. per mil is prescribed, the final volume will be 710 mls. By modifying the final dilution, stronger solutions, containing 0.04 Gm. or 0.05 Gm. may be prepared if required. Such solutions may be heated to 110° or 120° C. without showing any turbidity. Injections sterilized at these higher temperatures, however, occasion more pain than those treated with live steam at 100° C. *Calomel* injections as usually prepared occasion considerable pain, and formerly were made with wool-fat as the vehicle. In consequence of the present difficulty in obtaining wool fat, olive oil washed with alcohol and sterilized has been used successfully as a substitute. More satisfactory still, giving more easy and perfect suspension of the calomel, is a mixture of equal weights of lard and olive oil. Olive oil 50 Gm., lard 50 Gm., are melted together on the water-bath, washed with alcohol, 95 per cent., 60 Gm.; being left in contact for twelve hours with occasional

agitation. The washed fat is then transferred to a capsule, and the adhering alcohol evaporated off on the water-bath. This basis may be sterilized in an autoclave at 130° C. or on a sand-bath at 120° C. Into a sterilized tared graduated 100 mil flask are then introduced crystalline guaiacol, 10 Gm.; camphor, 10 Gm. Precipitated calomel 5 Gm., is then rubbed down in a sterile mortar with a little of the lard and oil vehicle. This is transferred to the flask containing the guaiacol and camphor and made up to 100 mils with more of the oily mixture. If a graduated flask is not available, approximately the same dosage may be obtained by using 70 Gm. of the mixture. Precipitated calomel, being amorphous, is preferable to that prepared by sublimation for this purpose, since it affords a perfectly homogeneous suspension, is very active therapeutically, and painless on injection.—Bull. Sci. Pharm.; through Pharm. J., 98 (1917), 419.

Mercuric Chloride.—*Treatment of Poisoning Cases.*—H. B. Weiss discusses the Lambert and Patterson treatment and compares it with his treatment, which was devised before the publication of the Lambert and Patterson paper (Arch. Int. Med., Nov. 1915, 865). The latter investigators advise stomach lavage and colon irrigation, a liquid diet of 8 ounces of milk every 2 hours, alternated every two hours with a mixture of potassium bitartrate, 1 drachm; sugar, 1 drachm; lactose, $\frac{1}{2}$ ounce; lemon juice, 1 ounce; boiled water, 16 ounces. In addition, rectal injections of 1 ounce of potassium acetate in 1 pint of water are given.

Weiss uses a modification of the old English "potus imperialis" and call it "imperial drink." This consists of potassium bitartrate, 60 grains; sodium citrate, 30 grains; sugar, 60 grains; lemon or orange juice to taste; water 8 ounces.—J. Am. Med. Assoc., 68 (1917), 1618.

Mercuric Lactate.—*Stability of.*—This salt is used in France, in a 1 : 1000 solution, for the treatment of infantile diseases of syphilitic origin. It has, however, the reputation of being unstable, and easily converted into mercurous lactate, a salt which gives rise to intolerance, and even to symptoms of mercurial poisoning. At a meeting of the Société de Pharmacie, François showed solid mercuric lactate to be perfectly stable. In solution, it undergoes re-

duction to mercurous lactate with considerable rapidity in strong solutions. In the dilute 1 : 1000 solution used in medicine, this change, however, when it occurs, is so slight that it is quite negligible.—J. pharm. chim., 15 (1917), 28.

Mercury Oxycyanide.—*Examination of Tablets of.*—E. I. van Itallie and W. F. Woutman having found a sample of mercury oxycyanide containing only 4 per cent. of the true salt, combined with a large percentage of mercury cyanide, examined three samples of commercial salt which contained 3.27 per cent., 54.76 per cent. and 100 per cent. of oxycyanide, respectively. The pure salt was less soluble in water than the other two, because the solubility of mercury oxycyanide is increased considerably by the addition of mercury cyanide. The method applied for assaying the salt was the well-known Rupp process: 500 Mgs. of the salt were titrated with N/10 acid in the presence of methyl orange by which the oxycyanide $\text{Hg}(\text{CN})_2 \cdot \text{HgO}$ is determined, each mil of N/10 acid corresponding to 10.8 Mgs. of HgO or 23.4 Mgs. of $\text{Hg}(\text{CN})_2 \cdot \text{HgO}$. On now adding 2 grammes potassium iodide, by which the mercury cyanide is converted into potassium cyanide, the titration is continued, each mil of additional N/10 acid corresponding to 12.6 Mgs. of $\text{Hg}(\text{CN})_2$. Three samples of tablets which had been prepared with (a) sodium chloride, (b) sodium bicarbonate and (c) sodium carbonate and an alkali tartrate as diluents were examined by the same method, but this method worked only in the case of the tablets prepared with sodium chloride as diluents. The tablets prepared with carbonates were examined by Wastenson's method which is carried out as follows: 0.3 to 0.5 gramme of the material is heated in a Kjeldahl flask with 10 mls of sulphuric acid and 3 mls of nitric acid (sp. gr. 1.4) until the nitrous acid vapors are expelled and the flask is filled with sulphuric acid vapors. After cooling, 25 mls of water are added which is evaporated again by boiling and after cooling the residue is taken up in 25 mls of water and to the solution potassium permanganate solution is added until a faint but permanent pink color is produced which is removed again by the addition of a trace of ferrous sulphate. After the addition of 75 mls of water, the mercury is titrated in the presence of ferric alum with N/10 ammonium sulphocyanide solution, each mil of the latter corresponding to 10 Mgs. of mercury. The method works very well but the authors found that neither the addition of nitric acid nor the oxidation

with permanganate are necessary when applying it to mercury oxycyanide. By omitting the nitric acid the nitrogen obtained from the salt can be estimated also and this estimation can serve as a check of the estimation of the mercury. Tabulated, the results obtained with various samples of mercury oxycyanide and mercury oxycyanide tablets considering the latter as being prepared from equal weights of diluent and mercury salt, appear as follows, A, B, and C being mercury oxycyanide.

	Hg(CN) ₂ - HgO.	Hg(CN) ₂ .		Total Mercury.			
		Direct titra- tion.	Esti- mated as NH ₃ .	By Rupp's method.	Wasten- son's method.	Weighed as Hg.	Theory.
A.....	3.27	75.98	...	63.7	...	..	62.8
B.....	54.76	43.34	43.3	81.9	81.1	80.8	81.2
C.....	97.59	0.25	...	..	83.7	83.6	83.6
D.....	3.27	94.76	94.99	80.1	...	77.4	78.0
E ₁	64.04	29.61	...	78.8	...	..	78.3
E ₂	56.65	37.51	...	78.0	78.0	..	78.3
F.....	96.48	...	1.37	..	82.32	..	...

—Pharm. Weekblad, 54 (1917), 654. (H. E.)

Basic Mercuric Salicylate.—*Mercury Assay of.*—H. Lajoux discusses the mercury assay of this preparation. He finds the method given in the German pharmacopœia is deficient and that the molecular structure must be broken down before all of the mercury will be in assayable form.

He finds that when the salicylate is dissolved in potassium cyanide solution and is then supersaturated with hydrochloric acid, the mercury can be completely precipitated with hydrogen sulphide as sulphide. That in order to use Denigès' cyano-argenti-metric volumetric mercury assay, the salicylate must be decomposed either by heating with concentrated sulphuric acid or with hydrochloric acid and potassium chlorate. When the salicylate is dissolved in potassium cyanide solution and titrated direct by the Denigès' method, the mercury figure is about one-half of what it should be.—J. pharm. chim., 15 (1917), 241.

Mercury Sozoiodolate.—*Assay of.*—A. Herrmann determines the mercury in hydrargyrum sozoidolicum by shaking a 0.5 gramme

sample with 10 mls of water in a 200 mil glass-stoppered bottle, then adding 2 grammes of potassium iodide and after the resulting mercuric iodide has dissolved, the mixture is made alkaline with sodium hydroxide solution. There is then added a mixture of 3 mls of formaldehyde solution and 10 mls of water, the bottle being gently shaken during one minute. Then acidulate with 25 mls of diluted acetic acid, add 25 mls tenth-normal iodine V. S., and titrate excess of iodine with tenth-normal thiosulphate V. S., after all of the mercury has dissolved. One mil N/10 iodine = 0.01003 Gm. mercury = 0.031225 Gm. sozoiodolate. The mercury in *anogon* ($\text{HgOC}_6\text{H}_2\text{I}_2\text{SO}_3\text{Hg}$) is determined by adding 2 grammes of potassium iodide, 25 mls of tenth-normal iodine V. S., shaking for one to three minutes and titrating excess of iodine with tenth-normal thiosulphate V. S.—Arch. Pharm., 254 (1916), 498; through Chem. Abstracts (1918).

Mercury Thymolo-Acetate.—*Composition and Assay of.*—E. Rupp finds that thymol mercuric acetate is 2,6-diacetatomercurithymol, $\text{HOC}_6\text{H}(\text{CH}_3)_2\text{C}_3\text{H}_7(\text{HgOCH}_3\text{CO})_2$, since on treatment with glacial acetic acid, potassium nitrite and sulphuric acid, it yields 2,6-dinitrothymol. The sodium compound of 2,6-dihydroxymercurithymol, the 2,6-dichloromercurithymol and the 2,6-diiodomercurithymol were also prepared. The thymoloacetate can be assayed by heating 0.3 gramme with 5 mls of sulphuric acid and 1 gramme of potassium nitrite, boiling for 10 to 30 minutes until the mixture is colorless, then adding potassium permanganate to a permanent pink, then adding a drop of solution of hydrogen dioxide solution and then titrating with tenth-normal thiocyanate V. S.; ferric alum being used as an indicator.—Arch. Pharm., 255 (1917), 191; through Chem. Abstracts (1918).

Gray Oil.—*Preparation for Injection.*—G. Pégurier suggests the following method of preparing this mercurial:

Sterilize separately 26 grammes of anhydrous wool fat and 60 grammes of liquid petrolatum in flasks with a large opening and closed with a ground glass stopper and strong parchment, by heating at 120° for 20 minutes in an autoclave. Wash a mortar and pestle with alcohol, add 40 grammes of purified mercury, then add the sterile wool fat, triturated five hours in order to extinguish the mercury, then add the sterile liquid petrolatum in small portions,

employing most rigorous aseptic conditions. Finally fill sterilized 10 mil flasks with the mixture.—Repert pharm.; through Chem. Abstracts, 11 (1917), 1880.

ALUMINUM.

Aluminum Hydroxide.—*Use as Basis for External Applications.*—E. Crouzel proposes to use aluminum hydroxide in place of petrolatum, lard or wool fat as a basis for skin remedies. The washed magma at 30° is a semi-solid containing about 90 per cent. of water, is unctuous to the touch, unalterable in air (barring gradual drying), is unaffected by most chemicals (other than acids and alkalis), and incorporates easily with most of the medicaments directed to be combined with ointment bases.—Rép. de Pharm.; through J. pharm. chim., 16 (1917), 247.

Aluminum Tannin.—*For Intestinal Administration.*—According to Monneron and Guyet, a patent has been obtained for the preparation of a medicinal aluminum tannin compound which is claimed to be gradually dissolved in the intestines, where it acts as a mild astringent. To a clear solution of alum, 200; in hot water, 500; add a solution of gelatin, 30; in warm water, 300. The acid reaction is then neutralized with soda, and tannin 18, dissolved in water 100, is added, with constant stirring. The precipitate is washed free from sulphate, dried and powdered.—J. Sci. Chem. Ind.; through Pharm. J., 98 (1917), 499.

Bolus Alba.—*Requirements for.*—Commercial samples of white bolus vary considerably in their purity. J. Herzog and M. Leonard therefore recommend the following requirements: When 7 grammes of the bolus are shaken in a 200 mil measuring cylinder with 100 mils of a 0.1 per cent. methylene blue solution for two minutes, the supernatant liquid should be colorless. Five grammes of the bolus triturated in a mortar with 7.5 mils of distilled water should form a tenaceous mass. The product should be free from carbonates, sulphates, chlorides, iron salts, heavy metals, and magnesium and calcium salts.—Apoth. Zeit.; through Pharm. Weekblad, 54 (1917), 1258. (H. E.)

LEAD, THORIUM AND ZIRCONIUM.

Lead.—*Determination as Phosphate.*—Vortmann and Bader determined lead in a solution containing about 0.5 gramme of lead nitrate by treating it with 5 grammes of tartaric acid, rendering it then slightly ammoniacal, heating it at 80° and adding 100 mls of 10 per cent. ammonium phosphate solution. After keeping the mixture at 70 to 80° for 16 hours and subsequent cooling, the precipitate was collected, washed with dilute ammonium nitrate solution, dried, ignited at low temperature and weighed. Antimony is not precipitated under these conditions (especially if more tartaric acid is added) and may be determined as sulphide in the filtrate from the lead phosphate precipitate.—Z. anal. Chem.; through J. Chem. Soc. Abs. (A. V.)

Lead.—*Hardening.*—The addition of 2 per cent. of sodium to lead hardens it to such an extent that it rings when struck.—Chem. and Drug., 89 (1917), 822. (K. S. B.)

Lead Isotopes.—An interesting discussion has taken place in "Nature" between Professor F. Soddy and Dr. Arthur Holmes regarding the lead which is considered as the end-product of thorium and uranium. Deductions are being made as to the age of the different minerals according to the proportions of lead they contain. The curious fact is noted that the atomic weight of the lead obtained from various sources differs, the products being considered to be isotopes.—Pract. Drug., Oct. 1917, 38.

Lead Sulphate.—*Solubility in Concentrated Sulphuric Acid.*—Ditz and Kanhäuser give the following solubilities of lead sulphate in concentrated sulphuric acid at 17 to 18.5° :

100 Gm. of sulphuric acid	98.11 per cent. dissolve	0.54 Gm. lead sulphate
100 Gm. of sulphuric acid	98.94 per cent. dissolve	1.34 Gm. lead sulphate
100 Gm. of sulphuric acid	100.01 per cent. dissolve	4.21 Gm. lead sulphate
100 Gm. of sulphuric acid	101.13 (5% SO_3) dissolve	4.54 Gm. lead sulphate
100 Gm. of sulphuric acid	105.05 (15% SO_3) dissolve	8.23 Gm. lead sulphate

—Z. anorg. Chem.; through Pharm. Weekblad, 54 (1917), 1357. (H. E.)

Thorium Salts.—*Value in Amæbal Dysentery.*—At a meeting of the Société de Biologie, A. Frouin reported the curing of an obstinate case of dysentery by the administration of 5 grammes of

thorium sulphate in cachets at meal times during five days, after which time 4-gramme doses of the salt were given for another four days.—J. pharm. chim., 15 (1917), 270.

Zirconium.—*The Bromides of.*—E. Chauvenet describes zirconium bromide, ZrBr_4 ; hydrated zirconyl bromides, $\text{ZrOBr}_2 \cdot 8\text{H}_2\text{O}$ and $\text{ZrOBr}_2 \cdot 3\frac{1}{2}\text{H}_2\text{O}$; and zirconyl oxybromide, $\text{ZrOBr}_2\text{ZrO}_2$.—Comp. rend.; through J. pharm. chim., 16 (1917), 86.

Zirconium.—*The Fluorides of.*—E. Chauvenet describes zirconium fluoride, ZrF_4 ; fluorzirconic acid, H_2ZrF_6 ; zirconyl fluoride, ZrOF_2 ; zirconyl fluoric acid, $\text{ZrOF}_2 \cdot 2\text{HF}$; and the hydrated form of the latter, $\text{ZrOF}_2 \cdot 2\text{HF} \cdot 2\text{H}_2\text{O}$, which has hitherto been considered as a hydrated form of zirconium fluoride $\text{ZrF}_4 \cdot 3\text{H}_2\text{O}$.—Comp. rend.; through J. pharm. chim., 16 (1917), 29.

Zirconium.—*The Sulphates of.*—E. Chauvenet describes a number of compounds of zirconium and sulphuric acid. These include normal sulphates, an acid sulphate, $\text{ZrOSO}_4(\text{SO}_3)$; a basic sulphate, $(\text{ZrOSO}_4)_3\text{ZrO}_2$; normal zirconyl sulphate; acid zirconyl sulphate; 4 basic zirconyl sulphate, and several hydrated forms of the zirconyl salts.—Comp. rend.; through J. pharm. chim., 16 (1917), 122, 157 and 184.

Zirconyl.—*A Radicle of Zirconium.*—E. Chauvenet finds that the compound $\text{Zr}_4\text{O}_6\text{Cl}_4 \cdot 6\text{H}_2\text{O}$ contains a radical, ZrO , which he calls zirconyl. This he has verified by a study of the action of water on zirconium chloride and sulphite.—Comp. rend.; through J. pharm. chim., 15 (1917), 397.

ARSENIC.

Arsenic.—*Destroying Organic Matter Prior to Detection.*—Gautier and Clausmann find that the following simple method is preferable to those usually followed for the destruction of organic matter in the course of examination for minute quantities of arsenic. The animal or vegetable matter is first heated in a stove at 300°C . until it is crisp. It is then mixed in a mortar with 2 to 3 per cent. of its dry weight of pure quicklime, and water is added to slake the lime. The mixture is then powdered, transferred to

a flat porcelain dish and heated at dull redness until the ash is white or greyish. It requires no special attention: all the organic matter will be burnt off from the most refractory material in an hour or two. The cool ash is then taken up with water acidified with sulphuric acid, boiled, filtered, evaporated till white fumes appear, then diluted with 8 to 10 volumes of water, and introduced directly into the Marsh apparatus.—Compt. rend.; through Pharm. J., 99 (1917), 88.

Arsenic.—*Detection by the Method of the Dutch Pharmacopœia.*—In the third edition of the Dutch Pharmacopœia, Gutzeit's arsenic test had been adopted, while in the fourth edition the method of Mayencon and Bergeret is official. G. Romijn reports that the directions for this method which depends on the conversion of the arsenic into arsenic hydride and allowing this to act in a current of hydrogen on paper impregnated with mercuric chloride solution are not sufficiently clear to yield uniform results in the hands of different operators. He also states that while pure arsenic-free zinc is readily available in the market quite frequently a metal is found from which hydrogen is developed on the addition of acids only with difficulty. He therefore recommends using granulated zinc containing 5 per cent. of tin and coated with copper. This is done by allowing a convenient portion of the zinc to be in contact with a liquid containing 10 mls of 10 per cent. copper sulphate solution, 5 mls of 20 per cent. ammonia water and 35 mls of water, until the liquid has become colorless, then washing and drying the granules. The author further found that Bougault's method depending on the action of hypophosphoric acid and hydrochloric acid on the sample in the presence of hydriodic acid as catalyzer has no advantage over the method official in the present pharmacopœia. The sensitiveness of the test should be such that one Mg. of arsenic can be detected when added to the sample under examination.—Pharm. Weekblad, 54 (1917), 1216. (H. E.)

Arsenic.—*Determination of Small Quantities of.*—S. Koehler recommends reducing arsenic compounds by hypophosphorous acid instead of sulphurous acid. As little as 0.001 Mg. of arsenic can be detected when the liquid is viewed against a white background. The arsenic is then taken up in N/200 iodine solution and after the addition of sodium bicarbonate the excess of iodine is titrated

with sodium thiosulphate solution.—*Farm. Revy.*; through *Pharm. Weekblad*, 54 (1917), 161. (H. E.)

Arsenic.—*Penetration into the Brain.*—McIntosh and Fildes find that certain dye substances pass directly from the blood to the brain substance without being found in the cerebrospinal fluid, while others fail to penetrate into the brain. The chief factor controlling this passage is the solubility of the dye. This is not a general lipid solubility, but corresponds to the solubility in chloroform and in water, or, perhaps, to the partition coefficient in these solvents. The arsenical remedies at present employed for syphilis are to some extent inefficient for syphilis of the central nervous system, because they do not possess the requisite solubility to allow them to pass from the blood to the brain substance, and has nothing to do with their absence from the cerebrospinal fluid.—*Brain*; through *Pharm. J.*, 98 (1917), 453.

Arsenic.—*Presence in Baking Powders.*—Analysis of acid calcium phosphate baking powders on the market in England showed the presence of arsenic in many instances, sometimes as much as 400 parts per million. One sample contained 634 parts per million. Investigation traced the contamination to the sulphuric acid used in the manufacture of the acid calcium phosphate. The usual sources of pure sulphuric acid being closed due to war conditions, many manufacturers had been inadequately purifying their own supply, while in a few cases no attempt was made to remove the arsenic from the acid.—*Chem. and Drug.*, 89 (1917), 963. (K. S. B.)

Arsenates.—*Value as Insecticides.*—Tests having for their object the determination of the toxic action of solutions of various arsenates upon the common tent caterpillar (*Malacosoma pluvialis*) were conducted by A. L. Lovett and R. H. Robinson. The authors found that lead hydrogen arsenate was more efficient and active than solutions of calcium or basic lead arsenates of the same concentration. It was found that the quantity of arsenic retained by insects feeding upon plant parts sprayed with arsenic solutions, varies with the kind of arsenate used. While it was found that in the case of basic lead arsenate there is a rapid elimination, in the case of the lead hydrogen arsenate it was shown that most of this is retained in the tissues. Field tests using sprays of calcium

arsenate and calcium ammonium arsenate demonstrated that both of these caused too much injury to the plant foliage to render their use possible or desirable. It required about 0.1595 milligrammes of arsenic pentoxide to destroy 1000 small test caterpillars, and about 1.84 milligrammes of the same substance to destroy 100 nearly mature caterpillars.—J. Agr. Res., 10 (1917), 199. (G. C. D.)

BISMUTH.

Bismuth Acetate.—*Preparation of.*—Salkowski obtained bismuth acetate by dissolving the finely divided bismuth metal in a mixture of acetic acid and hydrogen dioxide or by dissolving the hydroxide in acetic acid. The acetate was formed as a crystalline product, which, however, was unstable, losing acetic acid under atmospheric and more rapidly under diminished pressure. Upon heating to 125° , acetic anhydride is given off and bismuthyl acetate ($\text{BiOC}_2\text{H}_3\text{O}_2$) is obtained which unlike the normal acetate is insoluble in water.—Biochem. Z., 79 (1917), 96; through J. Chem. Soc. Abs. (A. V.)

Bismuth Subnitrate.—*Incompatibility with Sodium Bicarbonate.*—A prescription among whose ingredients were bismuth subnitrate and sodium bicarbonate gave an explosive mixture. Linton points out that the subnitrate in the presence of water slowly liberates nitric acid, which in turn liberates carbon dioxide gas from the sodium salt.—Pacif. Drug. Rev.; through Drug. Circ., 61 (1917), 246.

CHROMIUM.

Chromium Phosphates.—*Hydrates of.*—The violet precipitate obtained by precipitating a cold solution of chrome alum with sodium phosphate is amorphous, according to A. F. Joseph and W. N. Rae, and has the formula $\text{CrPO}_4 \cdot 6\text{H}_2\text{O}$. Upon standing in contact with the residual chrome alum in solution, or upon boiling with water, a green crystalline tetrahydrate, $\text{CrPO}_4 \cdot 4\text{H}_2\text{O}$, is formed, as is the case if a hot solution of chrome alum be precipitated with sodium phosphate. By boiling with acetic anhydride, the dehydration may be carried further, $\text{CrPO}_4 \cdot 2\text{H}_2\text{O}$ being formed.—Chem. and Drug., 89 (1917), 153. (K. S. B.)

MANGANESE.

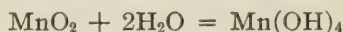
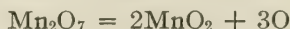
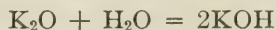
Potassium Permanganate.—*Poisoning by.*—During the past ten years only two fatal cases of potassium permanganate poisoning have been recorded. To these Racine adds a new case, where however the child was saved by immediate lavage of the stomach and by recourse to rectal administration of nourishment.—Zt. Med. Beamt.; through Drug. Circ., 61 (1917), 244.

Potassium Permanganate.—*Reduction by Metals.*—William Foster in a preliminary report announces the general observation that not only do all the common metals decolorize acidulated solutions of potassium permanganate, but dilute neutral solutions of the permanganate are reduced as well, even by finely divided platinum and gold. It was further observed that neutral solutions of potassium permanganate interact with the metals to form an alkaline solution, showing that potassium hydroxide is formed in every instance.

While it has been known for a long time that certain of the metals in the elementary condition interact more or less readily with potassium permanganate in aqueous solution, no one was familiar with the generalization that a neutral solution of potassium permanganate is reduced by all the common metals from the noble metals to the active metals, such as zinc and magnesium.

It would appear from numerous preliminary experiments that the various reactions involved are fundamentally the same, being summarized as follows:

In the presence of a metal, potassium permanganate suffers reduction with formation of oxygen, potassium hydroxide, and most likely hydrated manganese dioxide:



In the case of certain metals, *e. g.*, mercury, the oxygen converts the metal into an oxide, but such inactive metals as gold and platinum escape oxidation, serving merely as catalytic agents. In some cases, certainly, green potassium manganate is formed as an intermediate product of decomposition.—Chem. News, 115 (1917), 73. (J. A. K.)

IRON.

Iron Salts.—*Hypodermic Use of.*—L. M. Rowe reports on experiments on the hypodermic administration of iron and ammonium citrate solution to dogs. He states that this animal experimentation does not corroborate the untoward clinical results of the hypodermic use of iron salts and thinks that these untoward results may be ascribed to the fact that the anemic patient is unable to properly assimilate iron. He finds that a safe hypodermic dose of ferric ammonium citrate is 1 mil of a 10 per cent. solution.—*Therap. Gaz.*, 33 (1917), No. 12.

Copperas.—*Staining of Skin by.*—William Allen Pusey reports a permanent staining of the skin. The patient years before had been treated for eczema with a solution of ferrous sulphate and vinegar. The alkaline lymph at the ulcerating points caused a precipitate of organic iron compounds which were ultimately oxidized into ferric hydroxide.—*J. Am. Med. Assoc.*, 68 (1917), 627. (W. A. P.)

Reduced Iron.—*Assay of.*—Winkler suggests the estimation of the amount of metallic iron in ferrum hydrogenio reductum with-in 0.5 per cent. by igniting it in contact with air; the iron being oxidized to the oxide (100 grammes Fe give 142.9 grammes Fe_2O_3 . —*Z. angew. Chem.*, 30 (1917), 64; through *J. Chem. Soc. Abs.* (A. V.)

Reduced Iron.—*Assay of.*—A. Eberhard finds Winkler's method (see above) is untrustworthy since the increase in weight does not attain a constant value even after prolonged heating. He studied the pharmacopœial methods of different countries and recommends the Merck mercuric chloride process. He finds that the Schmidt bromine method fails on account of the loss of bromine vapor during the assay.—*Arch. Pharm.*, 255 (1917), 357; through *Chem. Abstracts* (1918).

COBALT.

Ammonio-Cobaltic Molybdate.—*Use in Quantitative Analysis.*—A. Carnot finds that the various cobalt-amines, dissolved by aid of an acid, form on the addition of ammonium molybdate, a precipitate of ammonio-cobaltic molybdate. This precipitation is

quantitative and can be utilized in the determination of cobalt in the presence of nickel, or even of zinc, cadmium or calcium. The cobalt-amines also precipitate when treated with ammonium tungstate, or ammonium vanadate.—*Compt. rend.*; through *J. pharm. chim.*, 16 (1917), 151.

PLATINUM.

Platinum.—*Production in Columbia.*—During the past few years the platinum industry of Columbia has advanced extensively. During 1907 the exportation of this metal amounted to about 245 troy ounces. In 1915 the exports amounted to 11,046 ounces, with a total value of \$494,888. All of this platinum was panned out of the gravels of the smaller streams. The platinum-producing zone is small in area, beginning at the mouth of the Condoto river, and extending a short distance north of the rivers Negua, Nemota and Bebarama. The area of the zone is only about 2700 square miles. Latterly a company has been organized for the purpose of working the platinum-bearing lands on the San Juan river, and is expected to begin actual operations shortly.—*U. S. Comm. Rep.*; through *C. U. C. P. Al. J.*, 24 (1917), 43. (G. C. D.)

Platinum.—*Substitute for.*—M. Neumann suggests the use of a thermo-element of nickel and nickel-chromium wire in place of the platinum used in pyrometers. This has been found to be efficient up to 1100° C., but for higher temperatures no substitute for platinum can be suggested.—*Chem. Ztg.*; through *Pract. Drug.*, Nov., 1917, 38.

ORGANIC CHEMISTRY

GENERAL SUBJECTS.

Aliphatic Aldehydes and Alcohols.—*Use in Perfumery.*—H. J. Prins points out the use of these chemicals in improving the odors of manufactured perfumes. Thus octyl alcohol has a sweet rose-like odor giving a rose perfume that sweet odor characteristic of the flower. Such aldehydes and alcohols are very much affected by small amounts of impurities. The article gives a table of the physical constants of the aldehydes and alcohols discussed.—Perf. Essent. Oil Record; through Chem. Abstracts, 11 (1917), 3378.

Amines.—*Decomposition of.*—P. Sabatier and G. Gaudion report the results obtained by treating amines with finely divided nickel, and resulting in the formation of aniline from various substituted anilines. Finely divided nickel was obtained by reducing nickel oxide at a temperature below 700°C . At a temperature of 350°C . nickel thus obtained converts cyclohexylamine into aniline, while at a temperature below 180°C . the reverse reaction takes place. Under like conditions piperidine yields pyridine, and primary amines are converted into nitrils. Methyl-*o*-toluidine yielded indol. In a considerable number of the reactions, ammonia splits off, thus ethylamine is converted into ethylene and ammonia, the ethylene in turn being further decomposed into carbon, hydrogen, methane and ethane. Benzylamine formed ammonia and toluene, and methylaniline and dimethylaniline yielded benzene, aniline, ammonia and a number of other products.—Compt. rend., 165 (1917), 309. (G. C. D.)

Aromatic Aldehydes.—*Color Test for.*—P. Pooth uses for the detection of aromatic aldehydes a 10 per cent. solution of sodium sulphanilate or of sodium naphthionate. These amines condense with aromatic aldehydes to form characteristically colored azomethines. If 3 to 4 mls of the reagent are heated on a boiling water bath in a porcelain capsule and if to it is added an alcoholic solution of the aldehyde a color running from pale brown to red is produced. Evaporation to dryness frequently accentuates the color.—Schweiz. Apoth. Ztg.; through J. pharm. chim., 15 (1917), 352.

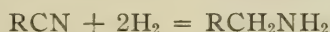
Chemical Constitution and Physiological Action.—*Relation between.*—The relation between the chemical constitution and physiological action of certain substituted amino-alkyl esters is discussed by F. L. Pyman in a paper which is a continuation of work previously performed in association with H. A. D. Jowett. A résumé of the previous work is given. He explains how cocaine is derived from ecgonine, and so from tropine. By substituting hydrogen for the methyl group attached to nitrogen a substance more active, but unfortunately more toxic, than cocaine was produced. Substitution in the methyl of the carbo-methoxyl group did not produce any great variation in the effects of the compound as a local anesthetic. Substitution of the benzoyl group by other acids showed that the *o*-chloro, the *m*-nitro, and the *m*-hydroxy derivatives still possessed anesthetic properties, while the results in the case of the *m*-amino, cinnamyl, and phenylacetyl derivatives were negative. The carbo-methoxyl group was shown to be non-essential to the anesthetic properties of cocaine. Neither was a double or even single ring structure necessary, as eucaine, stovaine, novocaine, and alypin still possessed these properties without having a ring-structure similar to that of cocaine. Dr. Pyman showed that the introduction of a methylene group between the phenyl and carboxyl groups of ethyl-*p*-amino benzoate (anæsthesine) and of diethyl amino-ethyl-*p*-amino-benzoate (novocaine) was accompanied by complete loss of local anesthetic action, the compounds examined, ethyl-*p*-amino-phenyl acetate and diethyl amino-ethyl-*p*-amino-phenyl acetate, being quite inactive. The amino alcohol, β -diethyl-amino- β' -phenoxy isopropyl alcohol, $\text{C}_6\text{H}_5\text{OCH}_2\text{CH}(\text{OH})\text{CH}_2\text{N}(\text{C}_2\text{H}_5)_2$, produced a distinct degree of local anesthesia, but its benzoyl derivative gave salts so acid in reaction that they could not be tested physiologically. It was mentioned that *p*-amino benzoyl-*p*-phenetidine has no local anesthetic properties. It was also pointed out that the nature of the alcohol radical, whether primary, secondary, or tertiary, has apparently no bearing on the presence or absence of anesthetic action.—Chem. and Drug., 89 (1917), 193. (K. S. B.)

Hydrotropic Phenomena.—Aqueous solutions of certain salts have the power of dissolving certain substances which are not soluble in pure water. This phenomenon is designated hydro-tropism. The salts of benzoic, salicylic, benzo-sulphonic, naphthoic and of various hydro-aromatic acids have this property. Their

solutions will dissolve or increase the solubility of carbohydrates, alcohols, aldehydes, proteins, alkaloids, fats, and lipoids, and many other substances. C. Neuberg quotes a number of examples of this action.—*Biochem. Z.*; through *Pharm. J.*, 98 (1917), 237.

Nitriles.—*Preparation from Amines by Catalysis.*—Mailhe and DeGodon describe the formation of nitriles from primary amines by the use of finely divided metallic copper or nickel. Thus when isoamylamine was treated with hydrogen in the presence of copper at 450° they obtained isoamylamine. When nickel was used, the transformation was accomplished, at 320° to 330°. Isobutylamine and hydrogen in the presence of nickel gave the nitrile $(\text{CH}_3)_2\text{CHCN}$ at 320° to 330°. When copper was employed a temperature of 400° was required. Ethylamine and hydrogen in the presence of nickel gave acetonitrile at 320°; methylamine similarly handled gave only traces of hydrocyanic acid; while benzylamine gave benzonitrile. Most of these reactions gave also the secondary or tertiary amines that are usually obtained from amine in question.

This work is of interest since it shows that the well-known reaction



is a reversible one.—*J. pharm. chim.*, 16 (1917), 225.

Nitrogen Assay.—*Kjeldahl Method.*—Nolte found that the digestion of caffeine and uric acid with sulfuric acid is accelerated when sulphur dioxide is passed through the mixture. Oxalic acid added also promotes the conversion of these substances.—*Z. anal. Chem.*, 56 (1917), 391; through *J. Chem. Soc. Abs.* (A. V.)

Nitrogen Assay.—*Kjeldahl Method.*—Wolf-Joachinsowitz introduces the sodium hydroxide as a concentrated solution slowly to the acid solution, thus forming a layer below this. By mixing the two layers only after the flask has been connected with the condenser and absorption apparatus, loss of ammonia is prevented.—*Chem. Ztg.*, 41 (1917), 87; through *J. Chem. Soc. Abs.* (A. V.)

Organic Compounds.—*Elementary Analysis by Means of Hydrogen Dioxide.*—On the properties of strong (15 per cent.) hydrogen dioxide solution in the presence of iron to oxidize organic matter

very rapidly Mandel and Neuberg have based a method for estimating halogens, sulphur and phosphorus in organic compounds. Merl and Lüft who have modified this method report on the determination of sulphur in saccharin by this process. About 50 Mgs. of saccharin, exactly weighed, are mixed in a 300 mil flask with 10 mls of water, two drops of strong hydrochloric acid, a crystal of ferrous chloride and 25 mls of 15 per cent. hydrogen dioxide solution. The flask is then provided with a reflux condenser which is connected with a double bend glass tube containing a mercury column of about 15 cm. length in order to allow the reaction to proceed under pressure. On slightly heating the mixture the reaction starts with a lively evolution of gas. In order to complete the oxidation, 25 mls more of hydrogen dioxide solution are added and the heating is continued. The contents of the flask are then transferred to a beaker and the sulphuric acid is estimated in the regular way as barium sulphate. The results obtained compare favorably with those obtained by melting saccharin with salt-peter-soda mixture.

The authors have used the method chiefly in the estimation of the halogen in the bromides of the fatty acids; in such a determination naturally halogen compounds should be avoided thus hydrochloric acid and ferrous chloride are replaced by nitric acid and ferric nitrate. The oxidation is carried out in the presence of an excess of silver nitrate and the silver halide is estimated in the usual way.—Z. Nahr. Genussm.; through Pharm. Weekblad, 54 (1917), 1287. (H. E.)

Organo-Metallic Compounds.—*New.*—L. F. Werner in a paper presented before the Cincinnati Branch of The American Pharmaceutical Association gives a résumé of the organo-metallic compounds used in the treatment of syphilis, etc., together with a comparison of their toxicity and efficiency. He concludes that the aromatic derivatives are the most effective but that these are too poisonous to be of much value.—J. Am. Pharm. Assoc., 6 (1917), 24. (H. H. S.)

Oximes.—*Catalytic Dehydration of.*—Mailhe and DeGodon find that aldoximes, $R-CH=NOH$, can be dehydrated by passing their vapors over heated aluminum and thorium oxides. By this method they have prepared isoamyl nitrile from isovaleraldoxime and heptane nitrile from α -nanthaldoxime.

They were also able to convert ketoximes into nitriles, something hitherto not accomplished. From isobutyron oxime, they obtained isobutane nitrile; and from isovalerone oxime, they obtained isovaleric nitrile.—J. pharm. chim., 16 (1917), 381.

Proprietary Medicines.—*Scheme of Analysis.*—W. S. Hubbard outlines a general method of analysis of nostrums. With liquid preparations, the salient points are preliminary tests, non-volatile, matter, ash, sugars, glycerol, chloroform extract from acid and from alkaline solution, alcohols, emodin, gums, resins, coloring agents, volatile oils and inorganic chemicals.

With powders, pills and tablets, the more important tests are preliminary examinations, coating, non-volatile material, ash, sugars, chloroform extract from acid and from alkaline solution, emodin, gums and resins.

For analytical details, the reader is referred to the original paper.—J. Am. Pharm. Assoc., 6 (1917), 548.

Synthetic Medicines.—*Microchemical Detection of.*—O. Tunmann detects the following chemicals by microchemical methods:

Veronal is sublimed upon a cover glass and is then treated with zinc chloriodide. Numerous small (40 microns by 20 microns), flat, tabular, prismatic, pale gray to blackish red crystals are formed. Acetanilid and salicylic acid do not respond to the reagent. The veronal sublimate treated with hydriodic acid gives large (150 microns long and 50 microns wide), flat, red or gray, optically biaxial crystals, that shine red between cross Nicol prisms. With bromine-potassium bromide solution, the veronal sublimate gives a mass of flesh colored and red needles and leaflets, showing marked pleochroism and measuring 50 to 80 microns. The veronal sublimate dissolved in ammoniacal copper solution gives pink to violet lamellæ or coarse plates.

Acetanilid sublimes treated with water and hydriodic acid give stable dichroic (red-brown and pale yellow) crystals of iodo-acetanilide. The bromine-potassium bromide solution gives fine needles transformed partly into prismatic aggregates.

Salicylic Acid can be sublimed without decomposition and the sublimate treated with water gave prismatic rodlets or rectangular prisms, which belong to the monoclinic system. If the

sublimate is treated with ammonia and then silver nitrate solution, well developed, oblique crystals of silver salicylate, some 100 microns long and 15 microns wide, are obtained.

Phenacetine sublimate treated with water yield two forms of crystals; one in flat prisms with oblique ends 15 to 20 microns wide and 100 to 150 microns long; the other as very long, flat, rectangular prisms, which invariably exhibit strong oblique grooves. When the sublimate is treated with water and nitric acid, characteristic yellow needles of nitrophenacetine are formed. When similarly treated, salicylic acid, acetanilide and antipyrine give only white crystals.—Apoth. Ztg., 32 (1917), 289; through Chem. Abstracts (1918).

Synthetics.—*American-Made.*—The Council on Pharmacy and Chemistry announces that, with the aid of the A. M. A. Chemical Laboratory, it proposes to make a study of the quality of American-made synthetics. This control of synthetic drugs, which as a result of the war are now made in this country, is believed to be in the interest of the American industry, for the protection of the public and for the satisfaction of physicians. Since the manufacture of some of the synthetic drugs is to some extent experimental in this country, the Council feels confident that the responsible manufacturer will welcome this study as the best way of establishing complete confidence in his products.—J. Am. Med. Assoc., 69 (1917), 1018. (W. A. P.)

Volatile Irritants in Collapse.—To determine the action of so-called circulatory stimulants that are commonly administered by subcutaneous injection in shock or allied conditions, Lieb and Herrick have studied the effects of injections of alcohol, ether, camphor and ether, camphor and oil, and turpentine in animals decerebrated so that the pain factor would be entirely excluded. They conclude that the transitory rise in blood pressure that these medicaments produce is entirely reflex in character. The heart plays little or no part in the process, the response being effected through the vasomotor apparatus. The use of injections of camphor in oil, or camphor in alcohol, to stimulate an anesthetized or profoundly prostrated or unconscious patient, therefore, has no experimental justification and its employment is seriously to be questioned.—J. Am. Med. Assoc., 69 (1917), 1008. (W. A. P.)

HYDROCARBONS.

Hydrocarbons.—*Pyrogenesis of.*—Any one desiring information on this subject beginning with Murdock's manufacture of gas from oil in 1792 up to Rittmann's method of cracking petroleum in 1916, should consult the article prepared by Lomax, Dunstan and Thole, for the Institute of Petroleum Technologists. The bibliography given in the article is unusually complete.—J. Ind. Eng. Chem., 9 (1917), 879.

Benzene.—*Detection of.*—For detecting benzene in forensic analysis E. Schmitz recommends distilling the object under examination with steam and receiving the distillate in carbon tetrachloride. The mixture of benzene and carbon tetrachloride is then nitrated by which the three isomeric dinitrobenzenes are formed which are solid at ordinary temperature and melt between 90° and 172° . These are collected on a filter, washed and dried to constant weight. The benzene is identified by Chavassieu and Morel's method. The author could detect benzene in the viscera of a man who has taken a solution of caoutchouc in benzene two weeks after death had occurred.—Pharm. Weekblad, 54 (1917), 1316. (H. E.)

Benzene.—*Explosive Mixtures with Air.*—According to Martini and Hueneke, mixtures of benzene vapor and air explode within wider limits than do mixtures of benzin vapors and air, quite contrary to general opinion and belief. Mixtures of air and benzin vapor, containing from 2.4 to 4.9 per cent. were found to be explosive. In the case of mixtures of benzene vapor with air the limits of explosibility were found to be from 2.7 to 6.5 per cent. Attention is called to the fact that impure benzene rests found in cans evaporate very slowly, and that although the cans be exposed to air, or even blown out with steam or air, explosive mixtures may still result with air.—Chem. Ztg.; through C. U. C. P. Al. J., 24 (1917), 64. (G. C. D.)

Benzene.—*Extraction of.*—At a meeting of the Society of Chemical Industry, R. Lessing described the recovery of benzene from coal gas. His proposal is to make use of dry material in the scrubber, the idea being based on the information obtained from the analysis of spent oxide, which is known to absorb some volatile

constituents from the gas. Spent oxide is, however, unsuitable, and the same applies to pitch on account of the lowering of its viscosity and blocking up the scrubber. He had therefore resorted to a porous material, such as broken bricks, etc., charged with pitch and coal tar. He fills the scrubber with this and the gas is passed through at about 5 feet per minute. Steam is then passed through and the distillate condensed in the usual way, repeating the process time after time with the same materials. He showed a scrubber in actual working, and the flame of a scrubber-gas was compared with that of the untreated gas, the latter showing a bright light, while the former was almost non-luminous. Experiments are now being carried on under the Ministry of Munitions on a large scale to determine the suitability of the new method.—*Pharm J.*, 89 (1917), 54.

Benzene.—*Fate in the Organism.*—Fuchs and v. Soos report that benzene is oxidized in the body with the resultant formation of muconic acid and that this acid can be isolated from the urine.—*Z. physiol. Chem.*; through *Drug. Circ.*, 61 (1917), 176.

Benzol.—*Recovery.*—Before the war the recovery of benzol was regarded with suspicion by makers of coke, because the market would not warrant the expense and the fear of loss of calorific value of the resulting illuminating gas. J. W. Schaeffer, before a meeting of the American Gas Institute, has shown that according to the average practice of 30 by-product coke plants, the actual loss in the calorific value of the gas amounts to only 5.8 per cent.

In a recent article in "Iron Age" it is stated that the demand of explosives of the benzol group will continue even after the war, as they will be used for commercial blasting operations. Moreover, the enormous increase in motor-drive vehicles calls for a corresponding increase in fuel supply. Abroad benzol has long been an important source of power and is now becoming better known in the United States. Besides these uses, benzol is employed in the manufacture of paints, stains, varnishes, lacquers, in the cleaning industries, in the extraction of greases and fats, as a solvent for rubber and in the manufacture of artificial leather.—*Sc. Am. Suppl.* No. 2157, May 5, 1917, 279. (O. R.)

Gasoline and Alcohol.—*Miscibility.*—Gasoline and alcohol do not mix in all proportions, but gasoline may be added to 95 per

cent. alcohol up to equal volumes.—Chem. and Drug., 89 (1917), 918. (K. S. B.)

Gasoline.—*From Heavy Oils.*—Dr. G. Egloff gave, at the Kansas City meeting of the American Chemical Society, the results of his experiments with an absorbent oil derived from a Pennsylvania crude petroleum of 0.828 specific gravity, of which over 95 per cent. boiled between 250° and 350° C. He subjected it to temperatures of 550° , 600° and 650° C. and pressure of one to eleven atmospheres. He gave his results in detail. At 15 lbs. pressure and at 550° C. he cracked off 11.6 per cent. gasoline and at the same temperature at 115 lbs. pressure he obtained 19.5 per cent gasoline. At 600° C. he obtained 16.4 or 18.8 per cent. of gasoline, according to the pressure, and at 650° C. the results were 16.8 and 14.2 per cent., respectively. At 550° C. and 11 atmospheres pressure the tar products ran above 12 per cent. This shows where a good deal of our gasoline comes from—"cracked off," as the expression is, from heavier oils.—Pract. Drug., May 1917, 38.

Liquid Petrolatum.—*Comparison of Russian and American Oils.*—Odom and Davies think that Russian oil for clinical, chemical and physical reasons, is better than American. They bring out that the clinical observations made to prove the efficiency of paraffin oil were all made with Russian oil. The differences in chemical composition, tests and specific gravity are also discussed.—J. Am. Pharm. Assoc., 6 (1917), 257. (H. H. S.)

Liquid Petrolatum.—*Use as Insecticide.*—Paraffin oil, mixed with enough lard to prevent its running, is recommended as an application to remove insects from fowls.—Chem. and Drug., 89 (1917), 978. (K. S. B.)

Liquid Petrolatum.—*Untoward Results from.*—O. Salomon reports on three cases of skin poisoning when liquid petrolatum instead of olive oil had been used for diluting ointments. The poisoning manifested itself in vomiting, dizziness and cyanosis. A chemical investigation showed that the petrolatum was free from any substances which are liable to produce these symptoms. O. Jacob also warns against using liquid petrolatum instead of olive oil in making camphor oil.—Feldärztl. Beil. z. Münch med. Woch.; through Pharm. Weekblad, 54 (1917), 1361. (H. E.)

Liquid Petrolatum.—*Irritant Properties when Impure.*—Nesbitt Burns says that insufficiently purified liquid petrolatum causes a skin eruption of a pseudo-erysipelas nature when used as a wound dressing.—Chem. and Drug., 89 (1917), 1039. (K. S. B.)

Liquid Petrolatum.—*Use in Wound Treatment.*—Although not an antiseptic, liquid paraffin is being used with excellent results in treatment of war wounds.—Chem. and Drug., 89 (1917), 915. (K. S. B.)

Naphthalene.—*Conversion into Liquid Hydrocarbons.*—In Germany annually about 80,000 tons of naphthalene obtained as by-product, are burnt, because there is no other use for this substance. F. Fischer has worked out a process to convert naphthalene into liquid hydrocarbons by treating it with aluminum chloride under pressure by which 40 per cent. of liquid hydrocarbons, in addition to coke and tar, are obtained. The hydrocarbons which are a hydration product of naphthalene resemble coal-oil, and may be used like this for illuminating purposes in specially constructed burners admitting good access of air.—Pharm. Ztg.; through Pharm. Weekblad, 54 (1917), 237. (H. E.)

Paraffins.—*Determining Melting Point of.*—Fleissig discusses this topic pointing out that Stein (1912) put water at 70° in a beaker 4 Cm. wide and upon it a lump of paraffin capable of forming an "eye" 6 Cm. wide. Keep the bulb of the thermometer immersed in the water and observe the temperature at the moment when a skin forms on the paraffin. Or, melt a 5 Cm. column of the paraffin in a test tube 2.5 Cm. wide, stir with a thermometer while cooling and read the temperature when congealing begins. Fleissig finds that for paraffins, congealing and melting points are identical, the melting point being determined by the method of the Swiss pharmacopœia. He, however, prefers the usual simple method, agitating the heating liquid (paraffin oil) with a ringlike mechanical stirrer by up and down motion.—Schweiz. Apoth. Ztg.; through Chem. Abstracts, 11 (1917), 1725.

Petroleum.—*Desulphuring of.*—F. M. Perkin, at a meeting of the Institute of Petroleum Technologists in London, described his method of desulphurizing petroleum, by treating the oil at high

temperatures with gaseous ammonia. The process is still in its initial stages.—*Am. J. Pharm.*, 89 (1917), 606.

Petroleum.—*Recovery Methods.*—Much of the oil in a field is now recovered. Bulletin No. 148 on Petroleum Technology, issued by the Bureau of Mines shows that the capacities of the oil sands in the various fields of the U. S. are from 5 to 10 times greater than the quantities of oil commonly extracted from them. The problem of increasing recovery divides itself into two phases—a better utilization of the natural forces, and the employment of artificial pressures. The original or abstract gives particulars.—*Sc. Am.* No. 2205, April 6, 1918, 215. (O. R.)

Soft Petrolatum.—*As an Intestinal Lubricant.*—Ordinary soft paraffin in doses of one to four teaspoonfuls is considered by N. Gifford to be preferable as an intestinal lubricant and more efficacious for the relief of chronic constipation than liquid petrolatum, although the latter has a much greater popularity. Not only does soft petrolatum mix more intimately with the intestinal contents, and therefore bring about a more complete alvine evacuation, but by its use all troublesome leakage is avoided. It is therefore a much more pleasant and cleanly lubricant for the patient. In results and convenience it is greatly to be preferred to any form of oily enema.—*J. Am. Med. Assoc.*, 68 (1917), 304.

Ichthyol.—*History of.*—The popular name of ichthyol, or tar-oil obtained from the bituminous material in the neighborhood of Seefeld, is "Dirsten," or "Tirschen" oil, after the name of the giant Thyrsus, who plays a part in the legends of Tyrol. In the sixteenth century Abraham Schnitser obtained from the Archduke Ferdinand the privilege of preparing ichthyol from certain deposits known under the name of "Tyrstenblud." Later on the peasants of Seefeld and Reit together prepared ichthyol in primitive kilns. Since 1845 the oil has been prepared in a more rational way by a company established in Innsbruck, which could not compete, however, against the "Maximilianshutte" in Reit. The process used was the same as that for distilling paraffin from shale. After 1860 the Seefeld peasants again began to prepare the tar-oil in the old way, and everywhere in the neighborhood of Seefeld the oil-kilns are found, and also a larger ichthyol manufactory. A large part of

the product is exported to Germany, Galicia, and Hungary, but in Tyrol itself peddlers of the product can often be seen still. The oil is largely used by the peasants as medicine for cattle, and it is also used as shoe-polish. If harness leather is rubbed with the oil it wards off flies.—Münch. Neueste. Nachr.; through Chem. and Drug., 89 (1917), 210.

VOLATILE OILS AND DERIVATIVES.

Volatile Oils.—*Analysis of.*—J. C. Umney thinks that the benzaldehyde test of U. S. P. IX is unsatisfactory. The end-point with methyl orange is not sharp and the results are low. The density figure for natural wintergreen oil is properly placed lower than for synthetic methyl salicylate. The density figures for balsam of Peru are too liberal. Authentic samples range from 1.135 to 1.155 at 25°. True balsam has an iodine number from 40 to 43, while the artificial product has an iodine number from 30 to 33.—Perf. Essent. Oil Record; through Chem. Abstracts, 11 (1917), 866.

Volatile Oil Analysis.—*Fractional Distillation in.*—Examples of American peppermint and sandalwood oils are cited in which it is shown that essential oils may be sophisticated in such a way that it is impossible to detect it without fractional distillation and examination of the fractions. If this procedure is followed it is practically impossible to escape detection.—Perf. Essent. Oil Record; through Chem. Abstracts, 11 (1917), 865.

Volatile Oils.—*British East African.*—E. J. Parry describes an African oil of *spike lavender* having sp. gr. 0.894; $\alpha = -10^{\circ} 30'$; esters, 3 per cent.; alcohols 44.1 per cent. A sample of *oil of rosemary* had sp. gr. 0.908; $\alpha = 1.0^{\circ}$; esters, 4 per cent.; alcohols, 15 per cent. A sample of *geranium oil* was disappointing, containing 12.1 per cent. of esters and having an odor that was not pleasing. An *oil of lemon thyme* contained 18 per cent. of citral and 6 per cent. of phenols.—Perf. Essent. Oil Record, 8 (1917), 263; through Chem. Abstracts (1918).

Volatile Oils.—*Determination of Alcohols by Acetylation.*—In the acetylation process for the determination of alcohols in essential oils, the results obtained vary according to the proportion of

acetic anhydride and anhydrous sodium acetate used. It is essential for obtaining uniform and constant results that the acetic anhydride should have density at least 1.080 and that it should contain not less than 95 per cent. of acetic anhydride, as determined by titration. It is desirable that the sodium acetate be freshly fused in order to insure the absence of moisture. A sample containing 6 per cent. of moisture gave a result nearly 6 per cent. lower than with the recently fused salt.—Perf. Essent. Oil Record; through Chem. Abstracts, 11 (1917), 866.

Volatile Oils.—*Various Esters of and Their Use in Perfumery.*—Prins and Schwarz discuss volatile oil esters, the acid constituents of which are seldom one chemical body. The principal acid is usually accompanied by its lower or higher homologs which have an ameliorating influence on the more or less dry odor of one ester alone. Descriptions are given of the odors of benzyl, cinnamyl, and hydrocinnamyl alcohols, geraniol and citronellol and their formates, acetates, propionates, butyrates and isovalerates.—Perf. Essent. Oil Record; through Chem. Abstracts, 11 (1917), 865.

Volatile Oils.—*Exportation from Seychelles.*—The value of the essential oils exported from Seychelles during 1915 (the latest figures available) was Rs. 42,115, against Rs. 16,482 in 1913. The increase has been seven-fold in the past three years. Twelve stills were at work, or under construction, in 1915.—Chem. and Drug., 89 (1917), 155. (K. S. B.)

Volatile Oils.—*Identification in Medicinal Preparations.*—E. K. Nelson publishes an important paper outlining a method of separating and of detecting volatile oils in preparations. The matter cannot be abstracted satisfactorily, so the reader is referred to the original article.—J. Am. Pharm. Assoc., 6 (1917), 543.

Volatile Oils and Immunity.—F. d'Herelle reports on various experiments to make immunizing vaccines from dead bacilli killed by means of essential oils. This process should have the advantage of not altering the albuminoidal matters and the diastases contained in the substance of the microbes.—Bib. Universelle; through J. Am. Pharm. Assoc., 6 (1917), 157.

Volatile Oils.—*Little Known.*—From the leaves of *Angophora lanceolata*, 0.09 per cent. of a volatile oil has been obtained. The leaves and twigs of *Artemisia cana* yielded 1.2 per cent. of volatile oil having sp. gr. 0.9405 at 15°; $\alpha = -19.09^\circ$; refractive index 1.4702 at 20°; acid value, 4.1 to 4.2; saponification value, 22.7 to 23.9 before and 110.3 to 111.8 after acetylation. It contained a camphor melting at 174° to 175°, yielding an oxime melting at 119 to 120°. The leaves of *Baekea frutescens* yield an oil (sp. gr. 0.883 at 27°) consisting largely of a stearopten. The resin from *Bursera paniculata* yields about 3 per cent. of oil distilling at 170° to 175° having an odor recalling the aroma of dill, fennel and lemon. *Excoecaria agallocha* yields an oil containing an ester, the alcoholic constituent of which melts at 85°. *Balon oil* comes from an oil of unknown botanical origin, containing a mixture of aldehydes. The oil has an odor resembling orange oil; sp. gr., 0.9042; refractive index, 1.47715; acid value 13.0, and ester value 20.5. *Quipita wood oil* has sp. gr. 0.934; $\alpha = -34^\circ 21'$ and contains small quantities of esters and a fair amount of an unidentified alcohol. *Maali oil* is distilled from a balsam resembling elemi, probably derived from *Canarium samoense*. It has a tea-rose odor, $\alpha = +7^\circ 15'$; saponification number, 3.3 before and 46.6 after acetylation and contains a sesquiterpene alcohol melting at 105° and having a rotation of $+18.3^\circ$. By dehydration with formic acid, there is formed a sesquiterpene having sp. gr. 0.919 at 15°; $\alpha = +121^\circ 20'$; refractive index, 1.5225; and boiling point, 271°. A so-called *sandalwood* from Port au Prince yielded 3.8 per cent. of oil, smelling like sandalwood, having sp. gr. 0.9799; $\alpha = +47^\circ 4'$; and "santalol" value 44.1 per cent. The flowers of *Helichrysum arenarium* yield 0.04 per cent. of a strongly aromatic volatile oil, smelling like celery, having sp. gr. 0.921; acid number, 14.45; ester value, 9; containing a stearopten melting at 48° to 50°; an acid melting at 34° to 36°; and a small amount of phenol. *Lycopus virginicus* yields over 0.075 per cent. of a volatile oil, having sp. gr. 0.924.—Perf. Essent. Oil Record; through Chem. Abstracts, 11 (1917), 865.

Volatile Oils.—*Russian.*—G. V. Pigulevskii has analyzed *Ruta graveolens*, *Rosmarinus officinalis*, *Ocimum basilicum*, *Laurus nobilis*, *Hyssopus officinalis*, *Salvia grandiflora*, and *Lavandula spica*. It was found that the Crimean ethereal oils do not differ essentially from the imported oils. It is indicated that the vast natural resources and favorable climatic conditions of Russia will

greatly stimulate the development of the oil industry in that country.—Soobshch. Biuro Chastn. Rast.; through Chem. Abstracts, 11 (1917), 2946.

Volatile Oils.—*Use as Vermin Destroyers.*—N. A. Coates states that a mixture of equal parts of oil of peppermint and oil of eucalyptus have been found by the soldiers highly effective. A little is smeared on the body with the fingers.—Prescriber; through Am. J. Pharm., 89 (1917), 613.

Oil of Achillea Millefolium.—E. R. Miller obtained a blue oil from the leaves and flower heads of this plant. Most of the oil is obtained from the flower heads, but very small amounts can be got from young plants. Drying the plant material produced no change in either the quantity or quality of oil. The oil contains *l*- α -pinene, *d*- α -pinene, *l*-limonene, *l*-borneol, bornyl acetate and other esters of borneol, *l*-camphor, cineol, salicylic acid, aldehydes, formic acid, acetic acid, butyric acid (?), isovaleric acid, at least one non-volatile acid or lactone, and a blue constituent of high boiling point.—Bull. Univ. Wis.; through Chem. Abstracts, 11 (1917), 2135.

Oil of Artemisia Annua.—This oil is a bright yellow camphoraceous liquid, which Y. Imada found has sp. gr. 0.8984 at 15°; acid number, 2.1; saponification number, 36.4 before and 66.36 after acetylation. On fractional distillation at 15 Mm., 270 grammes gave (a) 80 grammes at 62° to 70°; (b) 88 grammes at 70° to 80°; (c) 39 grammes at 80° to 90°; (d) 19 grammes at 90° to 100°; (e) 20 grammes at 100° to 108°; (f) 30 grammes of residue. Fraction (a) gave no tests for phellandrene, pinene, limonene or dipentene; fraction (b) contained cineol; fraction (c) on redistillation at ordinary pressure gave a fraction boiling at 185° to 190°, which on analysis showed the formula $C_{10}H_{16}O$, but which could not be recognized as any known substance.—J. Pharm. Soc. Japan; through Chem. Abstracts, 11 (1917), 2387.

Oil of Artemisia Annua.—Asahina and Yoshitomi continuing Imada's work (see above) find that his ketone $C_{10}H_{16}O$ designated *artemesia ketone* and regenerated from the semicarbazone, melting at 95° to 96°, boiling at 182°, sp. gr. 0.8906 at 14° is a new com-

pound; all the known ketones $C_{10}H_{16}O$ which occur in various essential oils, have a much higher density and boiling point. This ketone has in addition 2 double bonds and yields on catalytic reduction *via* Fokin-Willstaetter a *tetrahydro derivative*, $C_{10}H_{20}O$, which forms a *semi-carbazone*, $C_{10}H_{20}NHNCONH_2$, all of which facts point to the presence of an aliphatic ketone. The second ketone isolated from artemisia oil yielded a ketone agreeing in all essential points with that of camphor. The regenerated ketone was obtained in crystalline form, and proved to be identical with *l*-camphor.—J. Pharm. Soc. Japan; through Chem. Abstracts, 11 (1917), 3095.

Bay Oil.—*Cultivation in Montserrat.*—The year 1914 was the first in which the bay-tree (*Pimenta acris*) had been planted to any considerable extent in Montserrat. The Experiment station distributed 20,000 plants, enough to cover about 25 acres.—Chem. and Drug., 89 (1917), 460. (K. S. B.)

Bay Oil.—*Montserrat Crop of 1916.*—H. A. Tempany reports that samples of the 1916 oil had sp. gr. 0.926 to 0.940 at 30° to 31° and a phenol content of 46.5 to 54 per cent. The low phenol content was the result of a very wet season. There seems to be no correlation between phenol content and date of distillation, nor between phenol content and yield of oil.—Perf. Essent. Oil Record; through Chem. Abstracts, 11 (1917), 3379.

Bergamot Oil.—Parry reports that while this oil usually shows an average rotation below $+20^{\circ}$ and while the 1915-16 crop averaged $+14.6^{\circ}$, the 1916-17 Messina crop showed 24.5° or more.—Perf. Essent. Oil Record; through Chem. Abstracts, 11 (1917), 3379.

Camphor.—*As a Preservative.*—A piece of gum camphor the size of a pea dropped into the bottle floats on the surface of the fluid, does not dissolve readily and its fumes seem to destroy germs entering the bottle. R. Romanelli has thus kept white of an egg and a 5 per cent. solution of gelatin for more than a year without change. Solutions for hypodermic injection can be kept indefinitely. The claim is made that even if the liquid contains some alcohol so that the camphor dissolves this does no harm, since camphor is

used both internally and hypodermically.—Policlinico; through Chem. Abstracts, 11 (1917), 1722.

Camphor.—*In Tetanus in Horses.*—Poret reports favorably on the treatment of horses suffering from tetanus by subcutaneous and intravenous injections of camphor. In one case daily subcutaneous injections of 200 Gms. of concentrated camphorated oil, representing some 50 Gms. of camphor per diem, were given. The horse rapidly recovered, although the treatment was not commenced until ten days after the appearance of the first symptoms. Other cases were also successful. The results, it is stated, "were magnificent, when, in addition to these injections, daily intravenous injections of 5 mls of camphorated ether were given."—Rev. Vet. Militar.; through Pharm. J., 98 (1917), 419.

Camphor.—*Production in Florida.*—The twigs and leaves of the camphor laurel are cut off with shears, ground in a "hog," and then distilled with steam and the water drawn off from the gum. The waste twig and leaf pulp is used as a mulch around the trees. The method used in Japan for producing camphor kills the trees, but the shearing method used in Florida is not injurious to future growth. An acre of trees produces approximately 200 lbs. of gum annually, requiring about 100 lbs. of leaves and twigs for each pound of gum. Domestic production and import data are given.—Oil, Paint and Drug. Rep.; through Chem. Abstracts, 11 (1917), 1259.

Camphor.—*Production in Formosa.*—The estimated production of crude camphor in Formosa for the year ending April 1, 1918, is 7,056,720 lbs., of which 4,350,000 lbs. will be apportioned to American celluloid manufacturers. This production may be reduced by unfavorable weather to 1,320,000 lbs., which would reduce the American apportionment to 594,000 lbs.—Chem. and Drug., 89 (1917), 765. (K. S. B.)

Camphor Oil.—*Cultivation in the Federated Malay States and Mauritins.*—Camphor was first grown in the Malay States in 1904, when seeds were imported from Japan for the purpose. Distillation was begun in 1909 and in 1911, 0.13 to 0.5 per cent. of camphor and oil were obtained from fresh green prunings by use of the Japanese wooden still. Resort to metal condensers have since

increased the yield, 2 and 4 year old leaves and twigs giving average yield of 0.19 per cent. of combined camphor and oil. The oil had sp. gr., 0.920; rotation in 100 Mm. tube, $38^{\circ} 23'$; acid number, 1.1; saponification number, 3.6 before and 25.7 after acetylation. Fractional distillation of the oil gave a fraction boiling between 155° and 195° , containing 4.3 per cent. of cineol; one boiling between 195° and 225° containing 15.7 per cent. of camphor and a third fraction boiling between 225° and 275° . No safrol was found in the Malayan oil, although it is characteristic constituent of Japanese oil. This is probably due to the fact that the Malayan oil was made from the prunings from young trees, whereas the Japanese oil is from the old wood of mature trees.

The leaves, twigs, wood and roots of camphor trees grown in Mauritius were distilled. The factors for the oil obtained were specific gravity, 0.907, 0.906 and 0.925; rotations in 100 Mm. tube were $-20^{\circ} 4'$, $21^{\circ} 5'$, and $-6^{\circ} 20'$; cineol content 69, 65 and 72 per cent. The first two samples were distilled from a copper still; the third from a wooden one. Five other samples had sp. gr. ranging from 0.9143 to 0.9508; α_D from $-11^{\circ} 26'$ to $+13^{\circ} 36'$; cineol content from 38 to 56 per cent. The camphor oils of Mauritius differ considerably from the "light" and "heavy" camphor oils of commerce and the trees yield oil but no solid camphor.—Bull. Imp. Inst.; through Chem. Abstracts, 11 (1917), 2132.

Oil of Chenopodium and Chloroform.—*As Anthelmintics.*—The experimental findings of Maurice C. Hall, and Winthrop D. Foster indicate that oil of chenopodium should be accompanied by large doses of castor oil, and that when so given it is an uncommonly effective and quite safe anthelmintic for use against ascarids. Chloroform in castor oil, in therapeutic doses, is the most effective anthelmintic we have found for use against hookworms, and we consider it as safe as thymol or any other effective drug for use against hookworm disease.—J. Am. Med. Assoc., 68 (1917), 1961. (W. A. P.)

Oil of Chenopodium.—*In Dysentery.*—Walker and Emrich have conducted encouraging experiments with oil of chenopodium. Of fourteen endameeba carriers treated, ten were apparently cured, and four relapsed after treatment. These relapses are accounted for by the fact that these patients had not received the preliminary

purgation, which was subsequently found to be essential to the cure. The treatment consists in the administration of a purge of half to one ounce of magnesium sulphate at 6 A.M.; 16 minims of oil of chenopodium in gelatin capsules at 8 A.M., 10 A.M., and noon, followed by castor oil, one ounce, containing 50 minims of chloroform at 2 P.M. This dosage is for adults. [The dose of chloroform seems pretty stiff.—Ed.] The oil of chenopodium used by the authors had been kept for over a year exposed to tropical temperature and light in Central America. It is probable that with freshly distilled oil even better results would be obtained. Special emphasis is laid on the importance of active purgation preliminary to the administration of the chenopodium oil.—J. Am. Med. Assoc., 68 (1917), 1456.

Oil of Chenopodium.—*Pharmacology of.*—W. H. Salant reports on the pharmacology of oil of chenopodium and offers suggestions for the prevention of poisoning by this drug. This oil is now largely used for the eradication of the hookworm disease. While oil of chenopodium may be regarded as a safe remedy for patients in good physical condition, it should be used very cautiously in poorly nourished and weak or neurotic individuals. A diet containing a liberal amount of fats and carbohydrates fed for several days before the treatment is instituted, may render the drug much safer.—J. Am. Med. Assoc., 69 (1917), 2016. (W. A. P.)

Oil of Chenopodium.—*Pharmacology of.*—W. H. Zeigler reports a study of the action of oil of chenopodium on dogs. By such means, he has found that commercial samples do not vary greatly in potency; that the toxicity is not influenced by the age of the animal; that its absorption is more rapid from the stomach than from the intestines; that atropine antagonizes its depressant effect upon the respiration; and that small doses are non-toxic.—Interstate Med. J., 24 (1917), No. 10.

Citronellal.—*Isomeric Forms of.*—H. J. Prins, after repeated fractionations of carefully purified citronella obtained two main fractions. "A" had a boiling point of 203° to 204°; index of refraction, 1.45882 at 16°; sp. gr., 0.8880 at 14°; gave a semi-carbazone, melting at 85.5° to 86° and a semi-oxamozone, melting at 184° to 186°. "B" had a boiling point of 198° to 199°; index of refraction, 1.45742 at 16°; sp. gr., 0.8745 at 14°; gave a semi-carbazone melt-

ing at 83° to 84° and a semi-oxamozone melting at 189° to 190° . Both have slight optical activity. The higher refractivity and boiling point of "A" indicate that it is $\text{CH}_2 = \text{C}(\text{CH}_3)\text{CH}_2\text{CH}_2\text{CH}_2\text{CH}(\text{CH}_3)\text{CH}_2\text{CHO}$, while "B" is presumably $(\text{CH}_3)_2\text{C} = \text{CHCH}_2\text{CH}_2\text{CH}(\text{CH}_3)\text{CH}_2\text{CHO}$.—Chem. Weekblad, 14 (1917), 692; through Chem. Abstracts (1918).

Dextro-pinene Hydrochloride and Dextro-camphene.—*Pharmacology of.*—Dontas and Tsakalotos report a study of the pharmacologic action of these two terpene derivatives on the frog. They find that the action of dextro-camphene is analogous to dextro-pinene, while the hydrochloride of the latter acts similarly to dextro-gyrate camphor. Pinene hydrochloride gives heart palpitations which are more intense than those produced by camphor, but their durations are shorter. Pinene hydrochloride has little or no action on the respiration, whereas camphor has a marked action in this direction. The writers express surprise that a chlorine containing terpene and one containing oxygen should have such similar action and ascribe it to the similarity of the structure of the nucleus.—J. pharm. chim., 15 (1917), 19.

Oil of Eucalyptus.—*Cultivation in the Nilgiris.*—P. Singh finds that samples of Indian oil of eucalyptus have sp. gr. from 0.9065 to 0.9155 at 19° ; $\alpha_D = +5^{\circ} 27'$ to $-9^{\circ} 39'$; index of refraction, 1.463 to 1.466; acid number, 0.18 to 1.04; saponification number, 8.9 to 20 before and 17 to 21.68 after acetylation; eucalyptol content, about 56 per cent. Mature fresh leaves from trees over 50 years old yielded 1.16 per cent. of oil; fresh leaves from 10-year old coppice growth yielded 0.875 per cent.; those of 1-year coppice yielded 0.83 per cent. (The fresh leaves contain about 50 per cent. of water.) Leaves dried in the shade did not lose any oil, which occurs as an oleoresin under the waxy outer covering of the leaf; drying in the sun caused a distinct loss. From a commercial standpoint, it is best to dry the leaves in the shade in order that a larger amount can be distilled at one charge, which should not be less than a ton. A design of a suitable still is attached and estimates of costs in commercial practice are included.—Indian Forest Records, 5 (1917), 1; through Chem. Abstracts (1918).

Oil of Eucalyptus Macarthurii.—H. G. Smith collected three samples of this oil and found the following constants: sp. gr.

(at 15°), 0.9218, 0.9099 and 0.9214; α_D , +1.2°, +1.4° and +1.2°; index of refraction (at 20°), 1.4711, 1.4648 and 1.4718; saponification number (before acetylation), 169, 195 and 169.5; (after), 224 and 198.8; solubility in 70 per cent. alcohol, 1.2, 1.2 and 1.2 volumes. The bark oil is practically identical with that from the leaves.—J. Proc. Roy. Soc. N. S. Wales; through Chem. Abstracts, 11 (1917), 2258.

Oil of Geranium.—*Grown in the Nilgiris.*—P. Singh finds that the leaves and flowers of *Pelargonium graveolens* yielded 0.044 per cent. of oil of pleasing aroma containing 46.6 per cent. of free geraniol and 28.19 per cent. of combined geraniol. The climate of the Nilgiris is well adapted to geranium cultivation and distilling of the oil would probably be profitable.—Indian Forest Records, 5 (1917), 27; through Chem. Abstracts (1918).

Gingerol.—*Existence Confirmed.*—Brooks in his paper on the constituents of ginger oil (See Year Book 1916, 320) states that "gingerol claimed by Garnett and Grier to have been isolated by them, has no existence in fact." Grier in a letter insists that gingerol is a chemical entity and submits a letter from Professor A. Lapworth of the Victoria University of Manchester confirming his findings.—Pharm. J., 98 (1917), 207.

Ionone.—*Manufacture of.*—H. F. Slack states that the middle portions of the steam distillate from lemongrass oil contained the largest amounts of citral (up to 94 per cent.) and that the citral therein (1 part) by condensation with acetone (5 parts) yields ionone. The condensing agent should be in solution and the best is a 5 per cent. solution of sodium alcoholate in absolute alcohol; one part being used to 2 parts of citral. The condensation is carried out at as low a temperature as possible and immediately after completion, the excess acetone is removed by washing with water and the unused citral by steam distillation. The pseudo-ionone produced by the condensation is changed to ionone by boiling 100 parts for 6 hours with 15 parts of concentrated sulphuric acid, 500 parts of glycerin and 500 parts of water. Repeated rectification is necessary to obtain a high grade product.—Perf. Essent. Oil Record; through Chem. Abstracts, 11 (1917), 3379.

Oil of Lemon.—E. J. Parry points out that as the rotation of this oil varies from season to season from $+53^{\circ}$ to $+64^{\circ}$, and as the rotation is apt to be low when the citral content is high, the formulation of pharmacopœial standards is a difficult matter.—Perf. Essent. Oil Record; through Chem. Abstracts, 11 (1917), 3379.

Lemongrass Oil.—*Production in the United States.*—S. C. Hood in Bulletin 442 of Bureau of Plant Industry, United States Department of Agriculture discusses the soil and climatic requirements of lemongrass; its propagation, cultivation, harvesting; the distillation of lemongrass oil; its varieties; factors affecting the yield of oil; factors affecting the citral content of the oil; its solubility in alcohol, and the commercial possibilities involved in the production of lemongrass oil in the United States. The author feels that the consumption of lemongrass oil in the United States for the manufacture of ionone and for perfumery purposes is continually increasing, and believes that the demand is sufficient to warrant an attempt to grow the plant for the commercial production of the oil, in such parts of the country as possess the proper climatic requirements. It is estimated that the expenditure per acre, including preparation of the land, planting, fertilizing, cultivation, harvesting and distilling, would total twenty dollars (\$20) the first year. This expenditure is reduced to seventeen dollars (\$17) for the second and succeeding years. The returns are estimated at twenty-five pounds of oil per acre, at eighty cents (80c.) or twenty dollars (\$20) for the first year, and thirty-five pounds of oil per acre at eighty cents (80c.) or twenty-eight dollars (\$28) for succeeding years. No allowance has been made for such charges as taxes, insurance, interest, or depreciation of outfit. The author states that it is doubtful whether the production of lemongrass oil would be profitable if all overhead charges were placed against this crop alone, since the distillation plant would be in use only a few weeks in a year. However, if grown in connection with other volatile oil plants, so that a long distilling season would be secured, it is believed that this crop will yield returns comparing favorably with other crops grown on the same type of land.—Am. J. Pharm., 89 (1917), 180. (R. P. F.)

Oil of Mustard.—*Chemistry of.*—G. B. Van Kampen discusses the influence of thymol on the assay of mustard oil, its presence causing an apparent increase in oil content. This phenomenon

has not yet been satisfactorily explained.—Oliën en Vetten, 2 (1917), 156; through Chem. Abstracts (1918).

Oil of Orange.—*Yield from Florida Fruit.*—S. C. Hood states that the variation in yield of oil from Florida oranges ranges from 0.11 to 0.53 per cent. The oil content does not reach a maximum before the fruit is finally mature but is present in commercial quantity before the fruit is ready for harvest. Heavy rainfall during the harvest season will cause a considerable decrease in the oil content. The presence of rust mite does not decrease the oil yield of the mature fruit but may show some effect early in the season.—Am. Perfumer, 12 (1917), 297; through Chem. Abstracts (1918).

Oil of Peppermint.—*Factors Affect Yield and Quality of.*—The effect of cultural and climatic conditions on the yield and quality of peppermint oil is discussed in professional paper No. 454, by Frank Rabak, chemical biologist, Bureau of Plant Industry. This bulletin, recently published by the United States Department of Agriculture, is based on experiments in raising and distilling peppermint plants conducted from 1908 to 1912. Conditions of soil and climate, the author finds, are influential factors in the formation of oil and its constituents in the peppermint plant. Light sandy or loamy soil appeared to be most favorable for the production of an oil of high quality.

Distillation experiments were conducted with a view to determining the effect on oil yield of drying the plants previously to putting them in the stills. It was found that the yield of oil from fresh plants apparently decreases as the plant matures. Drying the plants before distillation results in a considerable loss of oil. The largest proportion of oil is found in the leaves and flowering tops. In experiments in distilling plants and parts of plants at different times of growth, the author found that the percentage of esters in the oil, which give the oil its fragrant, minty odor, increases as the plants approach maturity. The menthol content of the oil bears a close relationship to the ester content. The free acidity and ester content of the oil distilled from dry plants is considerably higher than in the oil from fresh plants. The drying of the plants causes conditions favorable to making esters, while the percentage of free and total menthol in oil produced from dried plants is also uniformly high. It was found also that the forma-

tion of esters and menthol takes place most readily in the leaves and tops of the plant.

In another test it was found that the effect of shade upon the peppermint plant is to decrease the making of esters and the formation of menthol. Experiments with plants allowed to freeze indicate that frost noticeably increases esterification and the formation of menthol.—*Am. Drug.*, 65 (1917), 9.

Petitgrain Oil.—*Export from Paraguay to United States.*—Exports of petitgrain oil from Paraguay to the United States in 1915 amounted to 23,040 lbs., valued at \$35,416.00; in 1916, 33,680 lbs., valued at \$60,496.00; in the first 6 months of 1917, 22,677 lbs., valued at \$45,043.00, against 12,914 lbs., valued at \$24,283, in the corresponding period of 1916.—*Chem. and Drug.*, 89 (1917), 825. (K. S. B.)

Petitgrain Oil.—*Quality of Paraguayan.*—J. C. Umney found that two samples of 38 and 40 per cent. ester content, respectively, showed optical rotation of 6.8° and 8° , the abnormally high rotation being probably due to the larger percentage of twigs in the material employed for distillation or to the presence of more fully developed fruits.—*Perf. Essent. Oil Record*; through *Chem. Abstracts*, 11 (1917), 2017.

Pine Needle Oil.—*Concentrated.*—A pine needle oil which is $2\frac{1}{2}$ times more concentrated than Siberian pine needle oil is manufactured by Buettner. It has a saponification number of about 210, corresponding to 73 to 74 per cent. of bornyl acetate and boils at about 230° . It possesses a very agreeable odor, especially when highly diluted.—*Pharm. Zentralhalle*; through *Drug. Circ.*, 61 (1917), 20.

The Oleoresin and Oil of Pinus Jeffreyi.—The following data is gleaned from *Phytochemical Notes* by L. J. Ostlund:

Acid and Saponification Value of the Oleoresin.

	Acid value.	Saponification value.
Expt. I.....	140.0	166.0
Expt. II.....	140.5	166.5

The oleoresin yields about 8.6 per cent. volatile oil having a specific gravity of 0.697 at 20° C., when subjected to ordinary steam distillation.

After saponification with sodium hydroxide another portion of the same specimen in five experiments yielded an average of 8.92 per cent. of volatile oil, showing that the yield of volatile oil is increased but slightly by saponification of the resin acid previous to steam distillation. When the oleoresin was distilled in large amounts the greater part of the oil (80 to 90 per cent.) came over during the first hour although some came over even after five hours. This oil, upon fractionation, yielded nineteen colorless fractions more or less uniform in composition and varying but slightly in specific gravity. From the twentieth to the twenty-third fraction, liquids were obtained which varied gradually from a trace of color to a decided yellow with a tinge of green.—J. Am. Pharm. Assoc., 6 (1917), 137. (L. S.)

Oil of *Pinus Sabiniana*.—Under the title of Phytochemical Notes which have formerly appeared regularly in the Journal but whose publication has for some years been interrupted, R. E. Kremers gives the results of his experiments with the above named oil. His investigations seem to prove that the oleoresin of the Digger's Pine of California upon distillation does not yield an oil resembling oil of turpentine, but a product which bears some resemblance to the lower fractions obtained from American petroleum. The collection of a number of fractions indicates that this product is almost pure heptane. The author outlines the methods employed in following out the investigations and gives tables showing the specific gravity of different fractions.—J. Am. Pharm. Assoc., 6 (1917), 11. (L. S.)

Oil of Rose.—*Production in Bulgaria.*—About 20,000 acres are devoted to rose culture in Bulgaria, the annual harvest yielding 35,000,000 to 45,000,000 pounds, or about 8,000,000,000 roses. A one-acre garden under favorable conditions produces 2,000 to 2,500 pounds of roses, from which 10 to 15 ounces of attar of rose may be distilled. Generally 180 to 200 pounds of roses will produce one ounce of the attar; there are about 200 roses to the pound. The total production of the attar varies with the seasons, but it averages 175,000 ounces. The largest rose crops on record were those of 1900, 1903, and 1906, which resulted in 180,000 ounces, 210,000 ounces and 225,000 ounces of attar, respectively. The 1916 production is small in comparison, not more than 110,000 ounces being

distilled. Nearly all the attar of rose produced in Bulgaria is exported, the largest markets being Paris, London and New York. The export in 1900 amounted to 180,000 ounces, in 1905 to 210,000 ounces, and in 1910 to 216,000 ounces. The average price, prior to the war, was \$12 per ounce. At one time during the Turkish régime the rose leaves were sprinkled with geranium oil, which produced a heavy yield of attar upon distillation, but this practice has long been discontinued, as the attar obtained partook more of the perfume of the geranium than of the rose.—*Am. Drug.*, 65 (1917), 59.

Oil of Rose.—*French.*—E. J. Parry says that French otto of rose cannot be judged by the standards for Bulgarian otto, because of its widely different character. The paper gives analyses of a number of samples of otto.—*Perf. Essent. Oil Record*; through *Chem. Abstracts*, 11 (1917), 2017.

Rosin.—*What is it?*—It is generally accepted that rosin is abietic acid anhydride, although the opinions in regard to its composition vary considerably. In order to throw more light on the subject, G. Cohn heated pure abietic acid at 160° to 170° in an oil-bath. On cooling a hard, glass-like mass was obtained which resembled white colophony. No loss in weight was noticed, therefore no formation of anhydride could have taken place. The mass, which even on prolonged keeping, did not show a tendency to crystallize, had the specific gravity 1.072 and when treated with ammonia, methyl alcohol or strong sulphuric behaved as the natural product. Heated at 200° a product was obtained which resembled yellow rosin and has the specific gravity 1.07. Cohn believes that rosin is nothing but more or less pure abietic acid.—*Chem. Zeit.*; through *Pharm. Weekblad*, 54 (1917), 767. (H. E.)

Oil of Sherungulu Tubers.—A sample of Sherungulu tubers (from *Kæmpferia ethelæ*) yielded 0.55 per cent. of a volatile oil having sp. gr. 0.924 at 15°; optical rotation, +26° 42' at 22°; acid number, 1; ester number, 11.5 before and 33.6 after acetylation. Fractional distillation gave 44 per cent. between 160° and 195°, 26 per cent. between 195° and 270°, and 30 per cent. of residue. The oil contains only small amounts of odorous principles.—*Bull. Imp. Inst.*; through *Chem. Abstracts*, 11 (1917), 685.

Thymol.—*Solubility in Mixtures of Water and Glycerin.*—M. Marquina finds that the solubility of thymol in water is 0.0952 to 100; in glycerin it is 1.71 to 100. The solubility in five mixtures ranging from 20 to 85 per cent. of glycerin are also given.—*Anales Soc. espan. fis. quim.*, 15 (1917), 262; through *Chem. Abstracts* (1918).

Oil of Turpentine.—*Use in Surgery.*—Turpentine is now used in surgery for controlling bleeding from various parts of the body, and has been found also useful in secondary hemorrhage. Mr. J. Watkin Edwards suggests a trial of equal parts of liquefied phenol, solution of ferric chloride and oil of turpentine. He thinks this will be as effective and cause less suffering.—*Brit. Med. J.*; through *Chem. and Drug.*, 89 (1917), 8.

Oil of Wintergreen.—*Manufacture in India.*—The distillation of gaultheria oil presents certain difficulties. By ordinary steam distillation the writer had little success. The notes made by him as to the best method of distillation are, briefly, as follows: Entire branches of gaultheria should be taken for distillation, as it does not pay to separate the leaves from the stalks. The gaultheria branches should be chopped fine before putting them in the still. The still should be provided with a closed coil inside it for maintaining and increasing the heat. This may be done by admitting steam at about 80 pounds' pressure. The pressure in the boiler should be kept uniformly at 70 to 80 pounds. It takes about 6 hours for a charge to distil over. The catch still will render the oil almost colorless, requiring no further rectification. The most economical scale of work will be to take about 1 ton per charge. If it be not possible to set up a steam distillation plant (which is by far the most economical arrangement), crude distillation is advocated in 200- to 400-gallon whiskey stills. The latter size gives better results than the former unless the steam is used at high pressure. The oil, being heavier than water, settles at the bottom of the Florentine receiver and not on the top, as is generally the case.

The distillation of wintergreen oil promises to be a profitable industry in Assam, provided adequate arrangements are made to cultivate the plant, in order to obtain a constant and sufficient supply of leaves.—*Indian Trade J.*; through *Pharm. Era*, 50 (1917), 380.

Oil of Wintergreen.—*Production in India.*—P. Singh states that the fresh plants of *Gaultheria fragrantissimum* yield 0.65 per cent. of an oil having sp. gr. 1.185 at 16°; $\alpha_D = 0^\circ$; refractive index, 1.400 at 25°; saponification number, 362.9; solubility in 70 per cent. alcohol, 6. *Gaultheria* gathered in the Nilgiris in winter, yielded only 0.12 per cent. of oil.—Indian Forest Records, 5 (1917), 33; through Chem. Abstracts (1918).

ALCOHOLS AND DERIVATIVES.

Acetone.—*Calcium Chloride Compound of.*—When acetone is dried with calcium chloride, using successive portions, combinations of the two may be formed. One of the compounds thus formed has the following composition: $\text{CaCl}_2 \cdot 2\text{C}_3\text{H}_6\text{O}$. When this combination is subjected to reduced pressure, it forms $\text{CaCl}_2 \cdot \text{C}_3\text{H}_6\text{O}$. Determination of vapor density and analyses have proven the existence of such compounds in form of definite combinations. They have been shown to be stable to 130° C.—J. Chem. Soc.; through C. U. C. P. Al. J., 24 (1917), 164.

Acetone.—*Source in Mahua Flowers.*—Acetone, the chief ingredient in cordite, is obtained from wood, maize and starch, and is commencing to become scarce. Two English scientists at Hyderabad discovered that one of India's commonest flowers, the blossoms of the mahua or mhowra tree, contain acetone in much larger quantity than any other vegetable substance, ten times richer than any other known wood. Manufacture on a large scale is now under way.—Sc. Am., May 26, 1917, 531. (O. R.)

Alcohol.—*Determination by a New Method.*—Ethyl alcohol is immiscible with concentrated solutions of potassium fluoride. Haines and Marden find that by adding potassium fluoride to a mixture of alcohol and water, the alcohol is quantitatively separated, and if a graduated tube is used for the operation the volume of alcohol may be directly estimated. The addition of a small crystal of malachite green, insoluble in water, colors the alcohol in such a way that the separation is quite apparent.—J. Ind. Eng. Chem., 9 (1917), 1126. (G. D. B.)

Alcohol.—*Determination in Very Dilute Solutions.*—For estimating alcohol in very dilute solutions Villedieu and Hebert give the

following method: 100 mls of the liquid are mixed with 10 mls of 33 per cent. caustic soda solution and to the liquid sufficient of a solution of 105 grammes of iodine and 180 grammes of potassium iodide in one liter of water is added to obtain a yellowish red liquid. After allowing the mixture to stand for three hours again, iodine solution is added until the liquid contains an excess of the halogen. It is then allowed to stand for 18 hours. The iodoform which has separated in the form of crystals is collected on a filter and washed with cold water until the filtrate no longer gives a precipitate with silver nitrate. The filter is then dried between bibulous paper, and the iodoform is converted into potassium iodide by boiling with 30 mls of concentrated alcoholic caustic potash solution. The potassium iodide is then titrated in the usual way with N/100 silver nitrate solution and N/100 ammonium sulphocyanate solution, and from the number of mls of silver solution used the percentage of alcohol is calculated. Each mil of N/100 silver nitrate solution used corresponds to 0.0001533 gramme of alcohol.—J. pharm. chim., 15 (1917), 41.

Alcohol.—*Determination of.*—George C. Aronstamm reviews at some length, a number of methods used in calculating the alcoholic content of preparations as required by the Federal and a number of State food laws.—Bull. Pharm., 31(1917), 26, 29. (C. M. S.)

Alcohol.—*Determination of Traces of Water in.*—Nussbaum recommends the method of Crismer and Rodt, which is based upon the fact that the point where the freezing of mixture of alcohol and gasoline, as showing by a clouding of the mixture, is called by the author "the critical point of solution." The presence of 1 per cent. of water raises the critical point 16°.—Schweiz. Apoth. Ztg.; through J. pharm. chim., 15 (1917), 230.

Alcohol.—*Effect on Color Vision.*—The influence of alcohol on the capacity to distinguish light and dark in the spectral red and green was studied by H. Schultz in the case of seven individuals. In normal vision, the acuteness for red and green was usually greater in the initial 10 minutes than in the subsequent 50 minutes. The effect of 90 per cent. alcohol in small doses was to increase the acuteness of vision for both colors. Large doses diminished it.—Arch. ges. Physiol.; through Pharm. J., 98 (1917), 405.

Alcohol.—*From Acetylene.*—This synthesis is theoretically easy. By hydrogenation the acetylene C_2H_2 can be converted into ethylene, C_2H_4 , which is transformed into ethyl-sulphonic acid by means of sulphuric acid; hydrolysis then transforms the sulphonic acid into ethyl alcohol, C_2H_5OH . But neither this direct way, nor various indirect processes, appeared for a time to prove technically profitable, and so the manufacture of alcohol from calcium carbide, which, treated with water, yields acetylene, seemed to remain a problem. Within the last few years, however, several of the large German chemical works have taken patents on the preparation from acetylene, by means of acid mercury salts, of aldehydes, which differ from their alcohols by a deficiency of two atoms of hydrogen. Whether and how far the preparation and hydrogenation of these aldehydes is at present being utilized in Germany it is impossible to say, but the alcohol department of the Swiss Government has lately granted a concession for the manufacture of 7,000 tons of alcohol per year from calcium carbide to the Elektrizitätswerk Lonza, A. G., of Gampel (in the Rhône Valley) and Basle, Switzerland. The works are to be opened within eighteen months, and are to supply at least 2,500 tons of alcohol to the Government. The new alcohol works are to be erected at Bisp, some miles up the Rhône, east of Gampel. The process of the Lonza Company consists in passing vapors of acetaldehyde, CH_3COH , mixed with an excess of hydrogen, over finely divided nickel (catalyst); water, and alcohol, $CH_3.CH_2OH$, are formed; the former is frozen out, and the excess of hydrogen gas reacts again with aldehyde vapor. The Swiss patent on which the process is based is not yet available over here.—Chem. Trade J.; through Pharm. J., 98 (1917), 442.

Alcohol.—*In Motor Fuel.*—Harold Moor says that the German army is running its motor vehicles upon a mixture of 4 volumes of alcohol with 1 of a solution of naphthalene in benzol.—Chem. and Drug., 89 (1917), 230. (K. S. B.)

Alcohol.—*Manufacture in British Guiana.*—The sugar factories in British Guiana will in the future make alcohol, instead of rum, as a by-product. The production should be from 4 to 5 millions of gallons per year, and will be taken by the government.—Chem. and Drug., 89 (1917), 560. (K. S. B.)

Toddy, Jaggery, and Arrack.—Browning and Symons give interesting details of the methods followed in Ceylon for obtaining the beverage toddy, the crude sugar jaggery, and the potable spirit arrack, from the unexpanded spadix of the coconut palm. Toddy is simply the saccharine juice which exudes from the immature inflorescences of various palms when cut or wounded. It rapidly undergoes alcoholic and acetous fermentation, due to the presence of wild yeasts. The gas-charged milky liquid, with its suspended yeasts, and an alcoholic content varying from 2 to 8 per cent., forms the beverage. Its odor is described as being repulsive to most Europeans; but apart from this, its flavor is not unpleasant, being likened to that of cider or champagne. If the toddy is to be used for jaggery making, fermentation is prevented by placing quicklime in the collecting pots. This unfermented toddy is merely strained to remove the lime and also the insects which usually swarm into the toddy pots. The strained liquor is then evaporated in large earthen pans over a naked fire to a syrupy consistence. This syrup is then poured into half coconut shells and allowed to solidify. Arrack is obtained simply by distilling the fermented toddy in primitive copper stills with copper worms. Since these are much corroded by the volatile fatty acids carried over with the alcohol during the distillation, the distillate is often markedly contaminated with copper. Although a much better yield of alcohol would be obtained by at once distilling the toddy as soon as it is received, this is not done. It is usually allowed to stand for some days in vats, during which time considerable acetous fermentation occurs, thus incurring great waste of alcohol. Fermented toddy changes so quickly that it is fit for drinking as a beverage only on the day on which it is tapped from the tree. It becomes sour and undrinkable in twenty-four hours. A vinegar of fair quality is obtained by storing it in vats with certain fragrant herbs for a year or more.—J. Soc. Chem. Ind.; through Pharm. J., 98 (1917), 23.

Chloral Hydrate.—*Assay of.*—M. François discusses assays of chloral hydrate. He finds Mueller method (measure of volume of chloroform produced on treatment with alkali) quick and reasonably exact. His figures show that the assay of the Codex (treatment with a known excess of alkali for 30 minutes and titration of the residual alkali) gives high results due to the secondary reaction.



If the official assay is modified by letting the mixture of chloral and alkali stand only a minute prior to titration, exact results are obtained.

The paper also describes tests for identity and for purity of chloral hydrate and modified assays for its syrup and solution.—J. pharm. chim., 16 (1917), 289.

Chloroform.—*Test for.*—Utz recommends the following: To 10 mls of chloroform add as much benzidine as will lie on the point of a knife and shake gently, when a clear solution will be formed. If the chloroform is pure, the solution will keep in the dark unchanged for twenty-four hours. If 0.01 per cent. of phosgene is present, the solution becomes cloudy almost at once, and in the presence of 0.1 per cent. a yellowish white precipitate is formed. If chlorine is present, the solution acquires first a pale rose, and afterwards a blue color; if hydrochloric acid is present, the solution becomes at once cloudy.—Apoth. Ztg.; through Pharm. J., 98 (1917), 353.

Ether and Steam.—*Use as Anesthetic.*—A mixture of steam and ether, inhaled between 85° and 95° F., is employed by Beresford Kingsford as an anesthetic.—Chem. and Drug., 89 (1917), 511. (K. S. B.)

Ether.—*Determination of Alcohol and Water in.*—R. L. Perkins gives curves from which the percentage of water and of alcohol can be derived after determining the density of ether before and after dehydration with potassium carbonate.—J. Ind. Eng. Chem., 9 (1917), 521.

Ether.—*Determination of Alcohol and Water in.*—Commenting favorably on the foregoing paper A. B. Lyons points out that for practical pharmaceutical purposes the calculations may be reduced to the following simple form:

Take the density of the sample at 25°/25°.

Take the density of the sample at 25°/25° after dehydration with dried potassium carbonate.

Call the difference between these densities, *dif*.

Call the difference between the density of the dehydrated sample and the density of absolute ether (0.70968), *dif'*.

$Dif \times 895 = \text{volume per cent. of alcohol.}$

$Dif' \times 185.5 = \text{volume per cent. of water.}$

—J. Am. Pharm. Assoc., 6 (1917), 553.

Ether for Narcosis.—D. Schenk again warns against keeping ether for narcotic purposes in bottles stoppered with corks, because the ether extracts, from the cork, substances which not only make the ether not conform to the official requirements but, according to the author, greatly reduces the anesthetic action and may produce bad after-effects. This substance extracted from the cork (which was once considered as being vanillin, a view which later on was found to be erroneous because the product does not react with phloroglucinol), can easily be detected by testing the ether with Nessler's reagent, which is more sensitive than potassium hydroxide.—Apoth. Ztg.; through Pharm. Weekblad, 54 (1917), 164. (H. E.)

Ether.—*Testing for Methyl Compounds.*—D. B. Dott states that difficulty has been experienced in securing a colorless test solution and one which would give definite reactions. The fault seems to be variation in the fuchsin. The test solution prepared after the formula of the British Pharmacopœia is often so deeply colored that it is impossible to observe the blue or violet color produced by the methyl compounds and some solutions fail to react. The writer suggests the following modification in preparing the solution: The solution should be cooled to 60° C. before adding the bisulphite and the acid should be added in 2 mil portions, shaking between each addition. The solution should finally be cooled before making up to one liter. The oxalic acid solution should be made half-strength and double the quantity used.—Phar. Jour., 98 (1917), 236. (C. W. B.)

Ether.—*Quality of Fuchsin Used in Methyl Test.*—Finding that results vary with different samples of fuchsin when testing ether for methyl compounds, D. B. Dott suggests standardizing each sample against ether containing 0.2 per cent. methyl alcohol before testing. A distinct violet-blue color should be developed inside 10 minutes.—Chem. and Drug., 89 (1917), 1060. (K. S. B.)

Formaldehyde.—*Condensation Product with Ammonium Thiocyanate.*—Schmerda finds that ammonium thiocyanate combines

with formaldehyde in molecular proportions without the evolution of carbon dioxide. The condensation product can combine with further quantities of formaldehyde, forming easily decomposable products. These were amorphous yellow compounds without definite melting points and are practically insoluble except in strong acids and strong alkalies. These products may find some pharmaceutical use, for if placed on wounds they induce the growth of a protective skin.—*Z. angew. Chem.*; through *Chem. Abstracts*, 11 (1917), 3377.

Formaldehyde.—*For Seed Grain.*—J. E. Taylor believes that the value of dilute formaldehyde for the treatment of seed grain should be brought by pharmacists in agricultural districts prominently before the notice of farmers. Eight fluidounces of 40 per cent. formaldehyde solution diluted to produce 40 gallons of liquid is used to moisten 50 bushels of oats or other grain. After being thoroughly moistened and turned over, the grain is left in a pile for three hours, then spread out to dry. This treatment is very effective in preventing parasitic diseases, and in increasing the crop. In one case a yield of 80 bushels per acre of oats was obtained from 80 acres of seed thus treated; the crop showed no trace of smut. Seed from the same bin sown without treatment yielded 65 bushels per acre, and one-fourth of this was affected with smut.—*Bull. Pharm.*, 31 (1917), 158.

Formaldehyde.—*In Tablet Form.*—Vanderkleed and E'we find that paraformaldehyde, the polymer of formaldehyde, is well adapted for making compressed tablets but has the great disadvantage that it does not readily liberate the gas and is too slowly and slightly soluble for practical use in the making of extemporaneous formaldehyde solutions. They find that the most practical manner to cause decomposition of the paraformaldehyde is to use some oxidizing agent. For this purpose they found barium peroxide ideal; safe in every way. Repeated rubbing and compression failed to cause explosion. Equal weights of the two chemicals were used. It was also found that the more concentrated the solution the more vigorous the reaction.—*Proc. Penna. Pharm. Assoc.*, 40 (1917), 236. (J. K. T.)

Glycerin and Antiseptics.—Dr. Helen P. Goodrich finds that glycerin impairs the antiseptic power of thymol, phenol, boric acid,

and mercuric chloride in aqueous solution. Many antiseptics, inorganic as well as organic, are much more soluble in glycerin than in water. For example, the approximate solubility per cent. at ordinary temperatures of the following substances in water and glycerin respectively are: Thymol, 0.06–0.526; phenol, 7.7–350.0; mercuric chloride, 5.26–61.5; boric acid, 4.0–25.0. It follows, therefore, that in a mixture of the two solvents more of the above substances will dissolve than in plain water. For example, in a mixture of equal volumes of water and glycerin about five times as much thymol will dissolve as in plain water, but the resulting solution has no better antiseptic power than the aqueous solution containing only a fraction of the amount of thymol. The same applies to boric acid: a saturated solution in water will kill all the organisms on a thin film of *Staphylococcus pyogenes aureus* in just over an hour, whereas a saturated solution in water and glycerin containing more than four times as much boric acid requires about six hours. It has long been assumed that solutions in glycerin were more antiseptic than the weaker aqueous solution, but it is a fact that even water compares well in disinfecting power with 50 per cent. glycerin. Pure glycerin easily kills protozoa, but it is by virtue of its osmotic action. Dilute solutions are not even preservative. Bacteriological experiments show that a 3.3 per cent. solution of phenol in water destroys all the individuals in a standard culture of *S. pyogenes aureus* contained on a thin film on a cover-glass in less than a quarter of a minute; the same strength solution in water and glycerin required more than a minute. Brit. Med. J.; through Pharm. J., 98 (1917), 453.

Glycerin Analysis.—E. Little and B. C. Fenner describe a modification of the bichromate method for the analysis of glycerin. In all, five solutions are required in the method: (1) a solution of basic lead acetate, obtained by dissolving 236 grammes of lead acetate in 1 liter of distilled water heating to boiling and adding 165 grammes of lead oxide (litharge) under constant stirring. Boiling is continued for a period of 15 minutes and the liquid then filtered and made up to 1 liter; (2) a solution of silver acetate, saturated in the cold; (3) a solution containing 15 per cent. of sulphuric acid; (4) sodium thiosulphate solution, N/5 or N/10; (5) a 10 per cent. solution of potassium iodide. The method is conducted as follows: A sample containing from 0.1 to 1.0 gramme of glycerin is transferred to

a beaker with aid of 100 mils of distilled water. Enough of the basic lead acetate solution is added, under constant stirring, to complete precipitation. The lead acetate solution must be added slowly, in small portions at a time, and the precipitate allowed to completely subside after each addition. The mixture is now filtered into a 250 mil flask and 12 mils of the silver acetate solution added. This is to remove chlorides. Subsequently enough of the sulphuric acid solution is added to remove lead and silver. The solution is then diluted to the mark and filtered, after thorough shaking, into a glass-stoppered flask. The approximate strength of the sample being known, the quantity of bichromate required to oxidize the glycerin contained in 25 mils of the prepared solution, is calculated. Next a quantity of bichromate, about 0.2 to 0.3 gramme in excess of the calculated quantity is placed in a 1000 mil conical flask, and 25 mils each of the prepared glycerin solution, distilled water and concentrated sulphuric acid, are added in succession. Care must be exercised in adding the sulphuric acid, a gentle shaking of the liquid while it is being added is desirable. If the color of the solution turns blue it is an indication that more bichromate is needed, and the operation will have to be repeated. Finally the contents of the flask are heated on a steam-bath, for 30 minutes, allowed to cool and diluted to 500 mils. Immediate titration with the sodium thiosulphate solution, after addition of 25 mils of hydrochloric acid (1 : 1) and 10 mils of the potassium iodide solution is then resorted to. Starch is employed as indicator. Each gramme of bichromate used is the equivalent of 0.1341 of glycerin. The authors state that the results agree with those found by the ordinary standard bichromate method.—J. Am. Leather Chem. Assoc.; through C. U. C. P. Al. J., 24 (1917), 163.

Glycerin.—*Assay of.*—Several years ago F. T. Bradt in a paper before the American Pharmaceutical Association, proposed a simplified form of the Hehner assay for glycerol. Unfortunately an error crept into the published paper, an error which one abstractor ventured to correct but which another failed to note. (See Year Book 1915, 271.) A. B. Lyons puts an end to criticism of the method by explaining why it did not work.

As corrected the detailed method should read: "weigh out accurately 5 Gm. of the sample of glycerin, dilute with distilled water to exactly 1 liter and take for titration exactly 5 mils of the solu-

tion (equivalent to 25 Mg. of the sample). Add 50 mls of tenth-normal potassium dichromate V. S. and 25 mls of strong sulphuric acid and heat in a suitable flask 20 minutes in a steam-bath. Cool, add 1 Gm. of potassium iodide (free from iodate); after standing 10 minutes dilute with 100 mls of water and titrate the liberated iodine with tenth-normal sodium thiosulphate V. S. Subtract the number of mls of the thiosulphate solution required from 50, multiply the remainder by 2.6303 for the percentage of glycerol in the sample. (This factor = $0.65757 \text{ Mg.} \div 25 \times 100$.)"

Mr. Lyon finds the assay trustworthy in the absence of any readily oxidizable impurities as well as easy and rapid.—J. Am. Pharm. Assoc., 6 (1917), 807. (Z. M. C.)

Glycerin.—*Detection of Small Quantities of.*—Wolff found the conversion into dihydroxyacetone (Denigè's reaction) a reliable test for the identification of glycerol, except in the presence of ethylene glycol now being used as a substitute for glycerol. Commercial glycol especially yields acraldehyde-like substances, when heated with potassium bisulphate. The refractometer numbers, however, are different, being more than 55 for glycerin and less than 15 for ethylene glycol.—Chem. Zeit., 41 (1917), 608; through J. Chem. Soc. Abs. (A. V.)

Glycerin.—*Substitutes in Germany.*—As German pharmacists have been prohibited from selling glycerin except when ordered by a physician, numerous formulæ for substitutes have from time to time been published. As a similar condition now obtains in this country the following information respecting certain German substitutes (some of which are proprietary preparations) may be of interest: (1) A 2 per cent. solution of gelatin mixed with an equal volume of glycerin. (2) Mucilage of quince seed, to which boric acid and alcohol are added. (3) Salep mucilage. (4) Algin, a mucilage made by macerating laminaria stalks with solution of sodium carbonate. (5) Carvien, a proprietary preparation of unknown composition. (6) An aqueous solution containing 21 per cent. of magnesium chloride and 40 to 50 per cent. of glucose. It does not dry, but it is utilizable for certain technical purposes only. (7) A concentrated aqueous solution of the potassium salt of a glycosaccharic acid or lactic acid, or acid allied to one of these.

(8) A solution consisting chiefly of calcium chloride, potassium lactate and mucilage. (9) A 5 per cent. quince-seed mucilage to which 10 per cent. of glycerin is added. (10) Glycol, neutral, sweetish in taste, miscible with alcohol and with water, and a good solvent for many organic substances. (11) Lempellin, a carrageen mucilage with borax and formaldehyde. (12) Mollphoras, a concentrated solution of sucrose and invert sugar; it does not crystallize even in a thin layer, and is said to be in many respects an efficient substitute for glycerin. (13) Novoglycerin, a gelatin solution. (14) Perglycerin and Perkglycerin; the latter is intended for pharmaceutical use, and appears to be a solution of certain undetermined salts; it is not miscible with tannin, borax, ichthyol; the addition of 5 per cent. of soluble starch improves it. (15) Proglycerin, an aqueous preparation for emulsion. (16) Protol, a glycerin prepared biologically.—Pharm. Ztg.; through Pharm. J., 98 (1917), 499.

Glycerin.—*Substitute for.*—Bearing in mind the necessity for replacing glycerin, without increasing the use of syrups, J. Lennox suggests the employment of a decoction of chondrus. He states that the following formula produces a fairly stable preparation having body and a sweet taste.

Irish Moss (washed).....	1½ oz.
Water.....	24 oz.

Boil for fifteen minutes in a covered vessel, strain with pressure, add boiling water through the strainer to make up to 19 fluidounces. Add 1 ounce of glucose, mix and strain without pressure.—Phar. J., 98 (1917), 186. (C. W. B.)

Iodoform-Acetone.—*A Styptic Antiseptic.*—W. Heiner reports that a solution of 10 parts of iodoform in 100 parts of acetone to which three drops of ammonia water have been added is an excellent styptic and antiseptic. The styptic properties of the solution are developed only three days after the manufacture. Compresses impregnated with the solution have successfully been used in sequestromy, osteotomy, etc. For deep-seated fistulas it is applied in conjunction with ortizon and perhydrite pencils. The solution is sterile and is claimed to produce rapid granulation of the wounds.—Münch. med. Woch.; through Pharm. Weekblad, 54 (1917), 164. (H. E.)

Methyl Alcohol.—*Detection and Estimation of Small Amounts.*—E. Elvove believes that in determining methyl alcohol by the method of Denigès, the ethyl alcohol concentration should be reduced to 0.5 per cent. The Schiff reagent should contain 0.5 gramme of fuchsin and 1.0 gramme of sulphur dioxide in a volume of 400 mls. Prepared in this way, the reagent will keep well for ten days. At the time of addition of the Schiff reagent the solutions should all be at room temperature. If formaldehyde is present it should be previously determined and an equivalent amount added to the methyl alcohol standards.—J. Ind. Eng. Chem., 9 (1917), 295. (G. D. B.)

Methyl Alcohol.—*Detection by Catalytic Dehydrogenation.*—Mannich and Geilmann have found that formaldehyde is easily formed from methyl alcohol, by passing the vapors of the latter over pieces of pumice impregnated with reduced copper, heated to 280 to 300°. The formaldehyde thus produced can be identified by the morphine-sulphuric acid or other color tests. The authors have by this process found 0.01 per cent. of methyl alcohol in a sample of urine.

If the product under investigation is a mixture of ethyl and methyl alcohol, the acetaldehyde produced by the process is driven off by warming the catalyzed mixture in vacuo. The authors have been able to detect, by this means, 0.5 per cent of methyl alcohol in brandy.—Arch. Pharm.; through J. pharm. chim., 16 (1917), 249.

Methyl Alcohol.—*Reaction of.*—As reagent for methyl alcohol, Sailer uses a 1 : 30 solution of beta-naphthol in strong sulphuric acid. When 2 to 3 mls of the alcoholic distillate are mixed with an equal volume of the reagent and when the mixture is warmed beta-naphthol methyl ester is formed which possesses the odor of orange blossoms. Ethyl alcohol forms the corresponding ethyl ester which has an odor recalling pineapple.—Pharm. Zeit.; through Pharm. Weekblad, 54 (1917), 1172. (H. E.)

AROMATIC DERIVATIVES.

Acetanilid.—*Preservative for Mucilage of Acacia.*—Acetanilid has been found to be a good preservative for mucilage of acacia.—Chem. and Drug., 89 (1917), 763. (K. S. B.)

Aromatic Aldehydes.—*New Reaction for.*—Azomethines, resulting from the condensation of aromatic aldehydes with aromatic amines, being very characteristic in color, are made use of by Porth to detect aromatic aldehydes. Three to four mils of a 10 per cent. aqueous solution of sodium sulphanilate or naphthionate, the latter being the better, is warmed on a water-bath, in a porcelain dish. A few drops of an alcoholic solution of the aldehyde are then added, when a color varying from pale yellow to red appears, becoming stronger upon evaporating to dryness.—Chem. and Drug., 89 (1917), 878. (K. S. B.)

Antipyrine.—*Color Reaction for.*—At a meeting of the Société de Biologie, C. Gauthier stated that when 0.1 gramme of antipyrine is dissolved in 10 mils of water and 1.5 mils of a 5 per cent. alcoholic solution of para-dimethylaminobenzaldehyde is added, followed by 1 mil of pure hydrochloric acid, there is produced an orange color that cannot be shaken out with ether or with benzene, that transmits a rose color to chloroform and a rose-orange color to amylic alcohol.—J. pharm. chim., 16 (1917), 189.

Antipyrine.—*Determination of.*—M. François comes to the conclusion that the gravimetric method for determination of antipyrine as iodantipyrine, is less reliable in its results than is the volumetric method. This consists in titrating an alcoholic solution of antipyrine, with an alcoholic solution of iodine, in presence of mercuric chloride, until a permanent yellow color is noted. Two molecules of iodine are absorbed by one molecule of antipyrine, under the conditions set forth in the method. It should be remembered that alcoholic solutions of iodine decompose rapidly, and must be frequently tested.—J. pharm. chim., 15 (1917), 97.

Antipyrine.—*Determination of.*—J. Bougault has modified the original volumetric and gravimetric processes devised by him as follows: For the volumetric process, ten mils of an approximately 1 : 100 aqueous solution of antipyrine is treated with 1 Gm. of potassium bicarbonate, and an excess of decinormal iodine solution is run in. A brown turbidity is at first formed, which soon separates in the form of crystalline needles, tinted black by the excess of iodine. After contact for an hour one mil of acetic (not hydrochloric) acid is added, and 10 mils of chloroform. This dissociates

the combination of iodine and iodo-antipyrine and facilitates the titration with hyposulphite, which terminates the process. Two atoms of iodine, 254, are equivalent to 1 molecule of antipyrine, 188. Very close results are obtained by this method. The gravimetric process, which is even more precise, is carried out thus: Fifty Cgms. of the antipyrine, dissolved in 50 mils of water, are treated with 2 Gms. of potassium bicarbonate. A solution of iodine in potassium iodide solution, containing 1 Gm. of iodine in 5 mils, is then added drop by drop, with constant stirring, and allowing the precipitate formed after each addition to disappear before more of the reagent is added. This is continued until a distinct excess of iodine is present, when colorless crystals of iodo-antipyrine will begin to form, which gradually become tinted by the excess of iodine. The mixture is then set aside for an hour. Sufficient thiosulphate solution is then added to discharge the color of the excess of iodine. The precipitate is collected on a suction filter, washed with a few mils of water, dried, and weighed. The bulked mother liquors and washings are then shaken out with chloroform, which after evaporation gives a further small amount of iodoantipyrine, the weight of which is added to the original assay. Three determinations by this method gave from 0.5 Gm. of antipyrine, 0.820, 0.825, and 0.826 Gm. (theory 0.834 Gm.). If from too rapid addition of the iodine reagent a black viscous mass should be formed, this must be redissolved by gently warming and again cooling before continuing the precipitation.—J. pharm. chim., 15 (1917), 337.

Benzaldehyde.—*Determination of Chlorine in.*—M. S. Salamon describes the following method, which he claims yields satisfactory results, the values obtained, however, being slightly below those of the Carius method. One gramme of the benzaldehyde is mixed with 40 mils of concentrated sulphuric acid, and 5 mils of strong nitric acid, and the whole heated in a retort. The heat must at first be applied very gradually, and frothing must be prevented. The resulting fumes are collected in a solution of silver nitrate, and the operation is allowed to continue until reaction ceases, about three hours being required. The silver mixture is now acidified with nitric acid and heated strongly to decompose any sulphites present. The resulting chloride of silver is then determined in the customary manner.—Perf. Essent. Oil Record; through C. U. C. P. Al. J., 24 (1917), 104.

Benzonaphthol.—*Adulterated.*—This compound is reported to be frequently adulterated with naphthalene and benzoic acid. Naphthalene is manifest by its odor. Free benzoic acid is detected by its ready solubility in alcohol. Solution of benzonaphthol in boiling chloroform should not become colored upon addition of caustic potash solution.—Drug. Circ., 61 (1917), 176.

Coal-Tar Industry.—J. F. Queeny presents an interesting article on the commercial significance of coal-tar derivatives and explains in a graphic manner the formation of some of the more important products from the raw material. He points out the awful waste permitted by coke manufacturers prior to the war, stating that of the 69,000,000 tons of coal coked in 1913, 52,000,000 tons were coked in the wasteful bee-hive ovens, and that the tar was saved from only 17,000,000 tons of coal. The article is illustrated with a strikingly drawn "Coal-Tar Genealogical Tree," showing the large number of valuable products obtained from the tar.—Pharm. Era, 50 (1917), 5.

Beechwood Creosote.—*Examination of a Commercial Sample.*—Smith and Acree have studied a sample of crude beechwood creosote prepared by an American manufacturer. They found that less than 3 per cent. distilled under 200° , that about 75 per cent. distilled between 200° and 360° , and that there was left between 20 and 25 per cent. of residual pitch. The major part of the distillate came over in one fraction boiling between 215° and 230° , and another boiling between 230° and 245° . The former fraction was extracted with 10 per cent. sodium hydroxide solution and yielded by this process about 40 per cent. of neutral oil and 56 per cent. of acid oil. From the acid oil by redistillation, there was obtained a yield of 65 per cent. of a guaiacol fraction boiling between 190° and 225° .—J. Ind. Eng. Chem., 9 (1917), 275.

Maplewood Creosote.—*Toxicity to a Wood-Destroying Fungus.*—Pieper, Acree and Humphrey find that the general composition and toxicity of maplewood creosote are practically identical with beechwood creosote. The alkali-soluble fraction is twice as toxic as the entire creosote and four times as toxic as the neutral fraction. The toxicity of the fraction boiling between 230° and 265° C., containing the tri-hydroxyphenols and their derivatives, among

them pyrogallol-dimethyl ether, is slightly higher than the fraction boiling at 195° to 230° C. which contain the mono- and dihydroxyphenols, as cresol and guaiacol. This toxic action is thought to bear a relationship to the physiological action in the human system.—J. Ind. Eng. Chem., 9 (1917), 566. (G. D. B.)

Maplewood Creosote.—*Composition of Higher Fractions.*—Pieper, Acree and Humphrey found that a commercial sample on distillation gave 75 per cent. of creosote and 25 per cent. of pitch. Of the creosote, 14 per cent. boiled at 93° to 195° C., 31 per cent. at 195° to 230°, and 55 per cent. at 230° to 280°. From 70 per cent. to 85 per cent. was found to consist of phenolic substances. Among the compounds identified were the di-methyl ethers of pyrogallol, methyl-pyrogallol and propyl-pyrogallol. These are also found in beechwood creosote, but in different amounts.—J. Ind. Eng. Chem., 9 (1917), 462. (G. D. B.)

Cresol.—*As Alkaloidal Precipitant.*—Vanderkleed and E'we note the fact that solutions of alkaloids, when treated with 0.3 per cent. solution of cresol are decomposed, the cresol causing liberation of the alkaloid. This phenomena was observed in connection with the following alkaloids: quinine hydrochloride, dihydrochloride, and sulphate, strychnine sulphate, narcophin, morphine hydrochloride, morphine diacetyl hydrochloride, and codeine sulphate. The authors lay stress on the importance of this discovery in connection with the well-known practice of using cresol as a preservative in solutions of an alkaloidal nature dispensed in ampuls.—Proc. Penna. Pharm. Assoc., 40 (1917), 233. (J. K. T.)

Cresyl Carbonate.—*Nitration of.*—Holleman and Hoafake subjected the process of nitrating *p*-cresyl carbonate to an extended investigation. Other investigators, among them Meister, Lucius u. Bruening, had found that the compound formed by such nitration was a meta-nitro derivative, instead of the ortho- or para-derivative which it was expected would form. A comparison of the proportions of ortho-, meta- and para-nitro derivatives obtained upon nitration of phenyl carbonate, toluol and para-cresyl carbonate, showed that while the free hydroxyl group has a much more decided influence than the methyl group, in determining the position to be taken by the nitro group, if the hydrogen of the first

group is replaced, as in *p*-cresyl carbonate, the directing influence of the hydroxyl group entirely disappears, and the influence of the methyl group is substituted.—*Rec. trav. chim.*; through C. U. C. P. Al. J., 24 (1917), 87.

Cumarone Resin.—Krumbhaar describes the use of this resin in the manufacture of lacquers. He finds it neutral in character, and of indifferent behavior toward saponification agents. Its best solvents are naphtha 1 or 11, to which benzin may be added. Drying is due to three factors, namely the volatilizing of the solvent, the polymerization of the paracoumarone, and the auto-oxidation of the paraindene. The last factor is said to be the most important one, and the presence of large amounts of paraindene in the resin is desirable and advantageous. At times the film becomes brittle and begins to crack, although usually it remains glossy and hard. Samples which do not remain hard when applied, may be treated with solid resins or linseed oil.—*Farben Ztg.*; through C. U. C. P. Al. J., 24 (1917), 103. (G. C. D.)

Dichloranthracenes.—*Derivatives of.*—According to D. R. P. 296019 the 9 : 10 dichloranthracenes form with nitric acid in indifferent cold media directly well-defined crystalline products

$$\text{C}_6\text{H}_4 \begin{array}{c} \diagup \text{CCl(OH)} \\ \diagdown \text{CCl(NO}_2\text{)} \end{array} \text{C}_6\text{H}_4$$
 which, especially on warming with commercial sulphuric acid, or organic solvents, decompose very readily yielding anthraquinones.—*Chem. Zentr.*, 1917, I, 460; through J. Chem. Soc. Abs. (A. V.)

Furfural, Methyl Furfural and Oxymethyl Furfural are substances which are obtained by the abstraction of water and ring formation by means of strong inorganic acids from the pentoses, methyl pentoses and hexoses respectively and which therefore may serve for identifying these sugars. The first named substance has been obtained by J. A. Middendorp in a pure state by fractional distillation in a high vacuum. When pure it melts at 31.5°. He found that wherever it is stated in the literature that by the action of strong acids on hexoses furfural is produced oxymethyl furfural is really formed. This is for instance the case with the well-known color reaction for all carbohydrates with α -naphthol and strong hydrochloric acid, originated by Molish. A violet color changing to brown is

given with hexoses (oxymethyl furfural), rhamnose (methyl furfural) and pentoses (furfural) and the absorption spectra of the respective solutions seem to be also the same. The condensation products with orcin, however, show a marked difference in color, *i. e.*, yellow, brick-red and greenish blue respectively. These reactions can therefore be utilized for identifying the sugars. The condensation products with resorcinol in sulphuric acid solution, (Selivanoff's reaction), and in strong hydrochloric acid solution (Fiehe's reaction), have also been utilized for differentiating the sugars. Oxymethyl furfural gives a red color which is almost identical with that produced with methyl furfural, but differs considerably from the dark purple color produced by furfural. Besides this, the coloring principle produced in the latter reaction is difficultly soluble in ethyl acetate in which the red coloring principle produced by the other two sugars is easily soluble.

The reaction of Ihl-Pechmann (a blue color produced by the action of hydrochloric acid and an alcoholic solution of diphenylamine) is given by the ketohexoses (fructose, cane sugar) much stronger than by the aldohexoses (glucose) because the former produce oxymethyl furfural much more rapidly. The coloration produced by these sugars differs from that produced by methyl furfural (rhamnose) and furfural (pentoses) and spectroscopically the different colors vary considerably also. The coloring principle produced with oxymethyl furfural is easily soluble in alcohol and ethyl acetate while that produced with furfural is only difficultly soluble in these solvents. This reaction, therefore, can be used for differentiating pentoses from hexoses.

The reaction with acetone in the presence of hydrochloric acid by which a red color is produced, originated by Rosenthaler and applied by Jaegerschmidt for the detection of oxymethyl furfural in artificial honey, is given by methyl furfural (rhamnose) and oxymethyl furfural (hexoses) while pentoses give a brown not characteristic color. The absorption spectra of the red coloring principles of methyl furfural (a line in orange) and of oxymethyl furfural (two lines, one in orange and one in green) are very characteristic and the reaction therefore may serve to distinguish methyl-pentoses from pentoses and hexoses.

The author further states that oxymethyl furfural, unlike furfural, is only slightly volatile with steam, only 3 Mgs. of it distilling over with 100 mls of water. These properties of oxymethyl furfural have unknowingly been utilized in the estimation of pen-

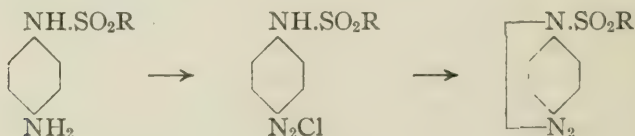
toses by Tollen's phloroglucinol method, which would be incorrect if oxymethyl furfural were as volatile with steam as furfural.—Pharm. Weekblad, 54 (1917), 1239. (H. E.)

Furfuroyde.—*Occurrence in Barley.*—J. L. Baker and H. F. E. Hulton claim that barley contains 3 to 5 per cent. of furfuroyde material (substances yielding furfural upon distillation with hydrochloric acid); brewers' grains containing 17 to 20 per cent., the rootlets 9.1 per cent. and the embryo 4.7 per cent. They also claim the presence of an enzyme capable of hydrolyzing barley furfuroydes.—Chem. and Drug., 89 (1917), 153. (K. S. B.)

Futuran.—*Composition and Use.*—Futuran is a condensation product of phenol and formaldehyde and is used as an insulator in place of hard rubber.—Chem. and Drug., 89 (1917), 689. (K. S. B.)

Naphthol.—*Poisoning by.*—A number of mangy horses suffered after treatment with a naphthol ointment from tremor, with hypothermy and difficulty of respiration. Later a yellowish red mucous substance secreted from the nose and the urine had a bloody appearance. Although the naphthol ointment was quickly washed off and hypodermic injections of caffeine and atropine were given, two horses died on the same day the ointment was applied. An autopsy showed an acute inflammation of the larynx and bronchial tubes and a dilatation of the lungs with hyperemia and edema.—Rep. pharm.; through Drug. Circ., 61 (1917), 246.

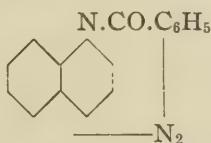
Paradiazoininobenzene.—*Acyl Derivatives of.*—By operating with liquid nitrous anhydride in anhydrous solvents, G. T. Morgan and A. W. H. Upton have found that the general reaction which takes place with para-aminosulphonamides—



—also occurs with acyl derivatives of *p*-phenylenediamine containing carboxyl groups—



This formation of a cyclic diazoimide by internal condensation has been demonstrated when $\text{R} = \text{H}$, CH_3 , or C_6H_5 . Benzoyl-1 : 4-naphthylenediamine behaves in a similar manner, yielding the diazoimide



—Chem. and Drug., 89 (1917), 271. (K. S. B.)

Phenacetine and Acetanilide.—*Assay of Mixtures of.*—R. Miller outlines a rapid, approximate method of determining phenacetine when mixed with acetanilide, which depends upon the well-known nitric acid test for phenacetine, which gives an intense yellow to orange-red color, and also upon the facts that phenacetine is soluble in methyl alcohol, and the addition of nitric acid to such a solution, properly diluted, gives a yellow color, the intensity of which is used as a measure of the phenacetine present.—Am. J. Pharm., 89 (1917), 156. (R. P. F.)

Phenol.—*Assay in Crude Carbolic Acid and Tar Oils.*—Weiss and Downs first distilled the oil down to coke in a copper tar still. By shaking the distillate with a 20 per cent. solution of sodium hydroxide the crude tar acids are removed and estimated volumetrically. After washing the alkaline solution with benzol to remove neutral oil the tar acids are freed with 25 per cent. sulphuric acid. The tar acids are fractionated, and the density and solidifying point of the fraction boiling at 190° to 197° C. is determined. Reference to a curve given by the authors will give the percentage of pure phenol in the distillate and from that may be calculated the percentage in the tar.—J. Ind. Eng. Chem., 9 (1917), 569. (G. D. B.)

Phenol.—*Liquefying.*—A safe and easy method of liquefying phenol has been suggested by Thomas D. McElhenie of Brooklyn.

If 6 fluidrachms of water are added to a pound bottle of solid phenol and the bottle shaken occasionally during the day, the next morning will find the entire contents in a liquid condition. This method eliminates the use of heat and consequently all danger incident to its use for this purpose. The subsequent addition of 8 more fluidrachms of water to a pound of acid produces a liquefied article conforming in strength to the U. S. P. IX.—Merck's Rep., 26 (1917), 8.

Phenol.—*Assay in Crude Phenol Mixtures.*—Crude phenol mixtures contain phenol, ortho-, meta- and para-cresols, xylenes, etc. The boiling points of the first four are respectively 182°, 191.5°, 201.8°, and 201.2°. The xylenes boil between 220° and 225°. If the mixture is fractionated at (a) up to 180°; (b) 180° to 203°; (c) 203°; if the phenol from the first fraction is salted out and mixed with the other two and if the mixture is redistilled the fractions coming over at up to 198° will contain practically all of the pure phenol possibly contaminated with some of the cresols. Masse and Leroux proceed as outlined above and then determine percentage of phenol in these fractions by their congealing points, having plotted a curve showing relation of congealing point to percentage of cresols present.—Compt. rend.; through J. pharm. chim., 15 (1917), 118.

Phenolic Compounds.—*Incompatibilities of.*—Noting the pasty mass produced in compounding a prescription calling for quinine hydrochloride, rhubarb, thymol and santonin, Astruc and Cambe studied the cause and found that a mixture of thymol and quinine hydrochloride becomes a paste and one of thymol and santonin becomes fluid. Nearly all quinine salts, except the tannate, become pastes when rubbed with thymol. Similar incompatibilities occur when thymol is triturated with caffeine, vanillin, pyramidon and urotropine. Theobromine, cryogenin, phenacetine and salophen do not thus react with thymol. The authors found that phenol, betanaphthol, resorcin, guaiacol and pyrogallol act as does thymol; while hydroquinone, pyrocatechol, phloroglucin, abristol, iodothymol, picric acid and benzonaphthol do not react as does thymol.—J. pharm. chim., 15 (1917), 383.

Phenolated Camphors.—Commenting on the foregoing article H. Lajoux points out that the liquefaction of phenol and camphor was first mentioned by Buffalini in 1873, and that in 1880 Lajoux

described the liquefaction of salicylic acid and camphor, and salicylic acid and thymol. He also cites the work of Cazeneuve (1889), Desesquelle (1890) and Leger (1890), on similar phenolated compounds.—*J. pharm. chim.*, 16 (1917), 79.

Phenolsulphonephthalein.—*Fate When Injected.*—Edward C. Kendall, devised researches to determine whether the dye was affected by reducing enzymes. The methods and results are given.—*J. Am. Med. Assoc.*, 68 (1917), 343. (W. A. P.)

Pyrocatechol.—*Differentiation from Hydroquinone and Resorcinol.*—J. Wolff employs the following reagents: (1) Soluble starch solution 1 : 50 containing 3 per cent. of potassium iodide. (2) Maceration of fresh *Russula delica* (or other fungus rich in laccase) in an equal volume of glycerin. This is strained through glass wool before use. (3) Acetic acid solution 5 : 100. (4) Sulphuric acid solution 4.9 : 100. Into 2 mls of a 1 : 1000 of either of the above diphenols add two drops of the glycerin maceration, 5 drops of the starch reagent, and 3 drops of the dilute acetic acid. In the presence of pyrocatechol a blue color quickly develops. Under similar conditions hydroquinone gives no color; but the blue tint slowly appears on using the dilute sulphuric acid reagent instead of acetic acid. Resorcinol fails to give a reaction when the reagent mixture is acidified with either acetic or sulphuric acid.—*J. pharm. chim.*, 15 (1917), 94.

Pyrogallol.—*Removing Stains of.*—Pyro stains on the fingers may be removed by dipping the fingers first into a strong solution of chlorinated lime and then rubbing the stains with a large crystal of citric acid. The operation is repeated until the stains have disappeared. Wash thoroughly afterwards. For pyro stains on negatives immerse in the following bath: Ferrous sulphate, 3 Oz.; alum, 1 Oz.; citric acid, 1 Oz.; water, 20 Oz. After this wash the negatives well.—*Amat. Photogr.*; through *Pharm. J.*, 98 (1917), 454.

Quinone Peroxides.—*Use in Dermatology.*—Brisse moret and Michaud find that peroxides of the various quinones, such as juglone, have marked effect upon skin eruptions, such as eczema, psoriasis and in petigo.—*J. pharm. chim.*, 16 (1917), 283.

Salvarsan, Etc.—Besides the German salvarsan and neosalvarsan, now practically unobtainable, the Council on Pharmacy and Chemistry of the American Medical Association has recognized diarsenol, neodiarsenol and arsenobenzol. Before accepting these preparations, the Council requires evidence to show that the products are manufactured under supervision which may be expected to insure their chemical identity and uniformity, and freedom from toxicity. However, in the past, untoward effects have been reported from German salvarsan and neosalvarsan, particularly with the last shipments of neosalvarsan. Recently untoward effects have been reported from neodiarsenol. It is expected that within a short time all salvarsan, neosalvarsan and the various products identical with these will be tested by the Government.—J. Am. Med. Assoc., 69 (1917), 1819. (W. A. P.)

Salvarsan.—*Imitation.*—The New York City Department of Health has unearthed a sensational fraud in the manufacture of fake salvarsan. The imitation, which was put up in New York and sold widely to the extent of at least 50 thousand ampuls throughout this country as well as in Canada, Mexico and Central America, consists of ordinary table salt colored with aniline dye. The package, circular, ampul and every visible detail of the original salvarsan are cunningly imitated.—Sc. Am., Sept. 22, 1917, 203. (O. R.)

Salvarsan.—*Manufacture Authorized in U. S.*—The Federal Trade Commission has granted orders for licenses to three firms to manufacture and sell arsphenamine, the product heretofore known under the trade name of salvarsan, patent rights to which have been held by German subjects. Provided conditions of the licensee are accepted by the firms, the following will be authorized to make and sell arsphenamine: Dermatological Research Laboratories of Philadelphia; Takamine Laboratory, Inc., of New York, and Herman A. Metz Laboratory of New York. The license stipulates that the name arsphenamine be used in connection with the trade name, that the product must be submitted to the U. S. Public Health Service for examination before sale, and reserves the right to fix the price.—J. Am. Med. Assoc., 69 (1917), 1989. (W. A. P.)

Salvarsan.—*Poisoning by.*—The "Reichsbote" warns against indiscriminately using salvarsan, since numerous cases of poisoning

manifesting themselves in blindness, paralysis and even death have been recorded. The paper suggests that every case of poisoning by this remedy should be reported to the government.—Pharm. Weekblad, 54 (1917), 148. (H. E.)

Salvarsan and Neosalvarsan.—*Toxicity of.*—C. L. Shields reports that out of the last twenty-three injections of neosalvarsan four cases exhibited severe poisoning and one resulted in death. He reports the experience of other physicians of severe toxic symptoms from the use of recent shipments of salvarsan and neosalvarsan.—J. Am. Med. Assoc., 68 (1917), 53. (W. A. P.)

Organo-Arsenical Antisymphilitic Remedies.—*Military Use in France.*—"The Lancet" gives a digest of the reports of military commands in France as to the treatment of syphilis by novarsenobenzol and similar compounds during the two years ending August, 1916. The number of medical officers giving injections was 185, and the total number of injections given was 94,762, of which all but 1,537 were for syphilis. The preparations used were:

	Times.
Neosalvarsan.....	35,826
Novarsenobenzol.....	37,352
Salvarsan and arsenobenzol.....	9,215
Galyl.....	8,846
Luargol.....	3,523

No fatal case was reported among the 95,000 injections, although in some cases toxic symptoms had appeared. The general criticism of the various preparations is as follows: Neosalvarsan: very good; novarsenobenzol preferred. All find it equal to neosalvarsan, sometimes better. Salvarsan and arsenobenzol: only one doctor remained faithful to its use throughout; galyl, very active, according to some; luargol is arsenobenzol reinforced with silver and anti-mony. Some doctors find it extremely active. One fatal case was reported in an addendum to the report.—Pharm. J., 98 (1917), 95.

Trinitrotoluene.—*Tests for.*—K. K. Stevens reports on "T. N. T." as follows: The greater part of T. N. T. made in the United States has, until recently, been sent abroad in the crude form. The refined article, by which is understood the recrystallized grade, has only been produced in a very limited number of plants. Each operation, or run as it is called, yields about 2200 pounds of prod-

uct. In accordance with the usual specifications, the shippers are required to pack the T. N. T. into cases or kegs, each lined with oiled paper, and containing from 60 to 100 pounds. Samples are generally taken representing lots of 4000 pounds, or two operations or "runs." The samples are taken from different parts of the package or case, properly mixed, and then placed in three 1-pound containers. One of these containers is retained by the seller, the other two are taken by the buyer and referee respectively, that for the referee being sealed by or in the presence of the representative of the buyer. *Color:* The crude T. N. T. possesses a light yellow color and the refined product is cream colored. Neither one should darken appreciably when subjected to a temperature of 100° C. for 2 hours. *Fineness of powder:* The specifications require that 90 per cent. of the crude T. N. T. shall pass through a 10-mesh sieve, and that 99 per cent. of the refined product shall pass through a No. 12 sieve. For the so-called "exploders," it is required that all must pass through a 30-mesh sieve. It occurs frequently that the crude T. N. T. contains from 7 per cent. to 8 per cent. more of coarser material than permitted. Moisture is determined by drying 2 grammes over sulphuric acid for 24 hours, and should not exceed 0.10 per cent. for either kind. In some specifications moisture to the extent of 0.15 per cent. is allowed. Acids must be absent, and the acidity therefore may be said to be negative. The determination is made by shaking 10 grammes of a fused sample with 100 mls of boiling water, cooling the mixture, decanting the aqueous liquid, and repeating the shaking with a further 50 mls of boiling water. The combined aqueous liquids are titrated with N/20 caustic alkali solution, using phenolphthalein as indicator. The acidity should not exceed 0.03 per cent., calculated as sulphuric acid. For other chemical tests, the reader is referred to the original paper.—J. Ind. Eng. Chem., 9 (1917), 801.

Trinitrotoluene.—*Poisoning by.*—When the skin or hair is exposed to trinitrotoluene by contact, a characteristic yellow or tawny orange stain is produced. It can be absorbed to a dangerous extent by the skin, and as fine dust or as sublimate will reach the mucous membranes of the nose and mouth, or perhaps even the lungs, and may be swallowed with the secretions of the mouth, nose and throat. It may be recovered by the feces unchanged in most workers, and in many from the urine, but only in combination. Among the symptoms it produces are dermatitis, gastritis, flatu-

lence and distention; and blood changes similar to those of dinitrobenzene poisoning, with the presence of methemoglobin, though cyanosis and breathlessness are less evident.—J. Am. Med. Assoc., 68 (1917), 459. (W. A. P.)

T. N. T.—*Use as Hair Dye.*—Some women munition workers have been dyeing their hair auburn by the use of trinitrotoluene. There is danger of causing a troublesome scalp dermatitis by this procedure.—Chem. and Drug., 89 (1917), 816. (K. S. B.)

Trinitrotoluene, Etc.—*Toxicity in Munitions Industry.*—Alice Hamilton, M.D., reviews the substances which are necessary for the production of explosives such as nitrocellulose, picric acid, phenol, benzene, toluene, trinitrotoluene, etc. She shows that this industry is full of dangers to the workers aside from the ever present dangers of violent explosions.—J. Am. Med. Assoc., 68 (1917), 1445. (W. A. P.)

Vanillin.—*Tests for.*—C. Estes finds that mercuric nitrate solution, made by dissolving mercury in twice its weight of nitric acid, sp. gr. 1.42, and diluting with 25 volumes of water, gives a violet to violet-red color with vanillin. The color is quantitatively developed. Since the acid mercuric nitrate solution will precipitate the resins from vanilla extracts, the color developed in the filtrate may be compared with that developed in standard vanillin solutions on treatment with the reagent.—J. Ind. Eng. Chem., 9 (1917), 143. (G. D. B.)

FIXED OILS AND FATS.

Adipocere.—*Analysis of a Sample of.*—After reviewing the work done by Boyle, Thouret, Fourcroy, Müller and others in regard to analyzing samples of adipocere, L. van Itallie and A. I. Steenhauer give the results of an analysis of a sample of adipocere which they obtained from the chemical laboratory of the University of Leiden. The sample was taken by Fourcroy in the Cimetière des Innocents at Paris from a corpse which had been buried about 130 years. The wax was found to consist of saturated fatty acids, very probably stearic and palmitic acid, together with their calcium salts.

A small amount of cholesterol a substance generally absent in adipocere, was found also. The ash (4.65 per cent. calculated for air-dry substance) contained the sulphates of iron, potassium and sodium.—Pharm. Weekblad, 54 (1917), 121. (H. E.)

Argan Oil.—*Characteristics of.*—S. Bernus has examined the oil of the seed kernels of *Argania sideroxylon*, a tree growing in Morocco, the wood of which is used in furniture. The oil has an amber-yellow color; a density of 0.918; contains 3.63 per cent. of free acid (calculated as oleic acid); has saponification number, 1.90; Huebl number, 100.58; Hehner number, 94.28; Reichert number, 6.07. Its refractive index is 1.4691. It has a pleasant taste and is therefore suitable as a table oil.—Union Pharm. et Bull. Comm.; through J. pharm. chim., 16 (1917), 246.

Basking Shark Liver Oil.—*Saturated Hydrocarbons in.*—Mitsumaru Tsujimoto finds that the oil from the liver of the basking shark, *Cetorhinus maximus*, contains much unsaponifiable matter. A sample of oil from the province of Hidachi had the following constants: sp. gr., 0.8839 at 15°; acid number, 1.09; saponification number, 102.45; iodine number (Wijs), 178.3; refractive index, 1.4773; butyro-refractometer, 78.2; unsaponifiable matter, 41.92 per cent. A 100 gramme sample distilled at a pressure of 5 Mm. yielded 10 grammes of distillate at 170° to 190° C., and 25 grammes at 244° to 260° C. The latter fraction was mainly squalene, an unsaturated hydrocarbon, $C_{30}H_{50}$. The first fraction was liquid at 0°, sp. gr. 0.7868 at 15°; refractive index, 1.4398; and absorbed only 4.4 per cent. of iodine, seeming to be mainly saturated. At 766 Mm. it distilled between 294° and 296° C. Upon analysis it seemed to be an iso-octadecane, $C_{18}H_{38}$.—J. Ind. Eng. Chem., 9 (1917), 1098. (G. D. B.)

Beechnut Oil.—*Production.*—Nineteen hectoliters of oil was obtained from 195 centners of beechnuts collected in Büdingen, in Upper Hesse, in 1916.—Chem. and Drug., 89 (1917), No. 1944, Supp. xxxvii. (K. S. B.)

Cholesterol and Isocholesterol.—*Separation of.*—Madinaveita and Gonzalez state that cholesterol and isocholesterol, obtained when wool-fat is energetically saponified, may be separated, with-

out much difficulty, after first converting into benzoates. Cholesteryl benzoate crystallizes in plates, while the iso variety assumes the needle form. The former may then be separated by elutriation with water. This is the method of Schulze. The authors state that the following method will be found more serviceable: The mixed alcohols are dissolved in ether and an ethereal solution of anhydrous oxalic acid added, when cholesteryl oxalate will be found to separate first.—Ann. Soc. Exp. Ph. Ch.; through C. U. C. P. Al. J., 24 (1917), 130. (G. C. D.)

Coconut Butter.—The American consul at Trinidad reports a local resource in the household manufacture and use of coconut butter. From 4 large coconuts it is possible to make 1 pound of butter, which, unless kept too long, is said to be as rich as the best creamery butter, from which it can hardly be distinguished except by a slight and altogether palatable flavor of coconut.—Sc. Am., May 26, 1917, 519. (O. R.)

Coconut Oil.—*Detection of.*—G. D. Elsdon has studied the method of Shrewsbury and Knapp ("Analyst," 1910, xxxv., 385) for the determination of coconut oil in mixtures, and also the modification suggested by Revis and Bolton ("Analyst," 1911, xxxvi., 334), but it has not been found possible to obtain concordant results by either method. In the present paper the suggestions of Revis and Bolton are further modified by the use of alcohol of sp. gr. 0.9200 and by thoroughly drying the cake of fatty acids before solution in alcohol, experimental evidence being given in support of these changes. In the author's hands the proposed process gives excellent results.—Chem. News, 115 (1917), 96.

Corn Oil.—*Hydrogenation of.*—Lackey and Sayre have studied the properties and pharmaceutical uses of corn oil and have also experimented with its hydrogenation. They constructed an experimental apparatus in which 250 mls of oil could be hydrogenated by use of nickel as a catalyst, and found that a temperature of 200° and a pressure of 50 pounds yielded after six or seven hours a solid product melting at 36° C.—J. Am. Pharm. Assoc., 6 (1917), 348.

Croton Oil.—*Use to Denature Alcohol.*—Croton oil is being used in Russia to denature alcohol.—Chem. and Drug., 89 (1917), 303. (K. S. B.)

Fats.—*Determination of Hydroxy Acids in.*—Hodes points out that hydroxy acids may remain undissolved, if as it is customary in the analysis of fats and oils, the fatty acids are extracted with ether or light petroleum. He suggests for the solution of these insoluble hydroxy acids a boiling mixture of equal volumes of alcohol (96 to 100 per cent.) and chloroform.—Chem. Ztg., 41 (1917), 492; through J. Chem. Soc. Abs. (A. V.)

Fats.—*Hübl and Wys Iodine Numbers.*—Kelber and Rheinheimer obtained concordant results with all methods used for oils and fats having weak iodine numbers. The bromide-bromate method gave too low results in the case of oils with large iodine numbers and the method of Wys was found preferable to that of Hübl.—Arch. Pharm., 255 (1917), 417; through J. Chem. Soc. Abs. (A. V.)

Fats.—*New Test for.*—Professor Lindet of the French Agronomic Institute has given to the Academy of Agriculture a very simple process of calculating rapidly the quantity of fatty matter in cream. This is the process:

A drop of cream is placed upon a sheet of paper and introduced at once into an oven heated to 105°. The watery part of the cream evaporates and the fat, absorbed by the paper, forms a spot which enlarges rapidly at first, then more slowly, as the edges of the spot increase their distance from the point at which the drop has been placed. At the end of a specified time the area of the spot is measured and compared with that of a spot formed by a drop of pure grease of the same size deposited at the same time and under identical conditions.

Professor Lindet uses drops of $\frac{1}{100}$ of a cubic centimeter in size, and places his paper in wooden frames to prevent it from curling up in the oven. He removes it before the spots have spread more than three or four centimeters in diameter.—Pract. Drug., Feb. 1917, 39.

Fats.—*Oxidation Numbers of.*—G. Issoglio explains that the oxidation number (x) is the amount of oxygen necessary to

oxidize the steam distillation products from 100 grammes of fat. He finds the following values of " x ."

Olive oil, 2.85 to 3.18; almond oil, 1.18 to 3.15; castor oil, 0.85 to 3.15; oil of theobroma, 3.81 to 4.93; purified lard, 0.58 to 1.12; purified beef fat, 3.25; fresh mutton fat, 6.48; rancid mutton fat, 25.26; yellow cod liver oil, 1.84 to 8.07; reddish brown cod liver oil, 20.42 to 38.42. The author recommends that (a) the oxidation number be included with the acidity number in the Italian Pharmacopœia to substantiate the good keeping qualities of medicinal oils; (b) x for medicinal fats and for benzoinated lards should not be allowed to exceed 10; (c) a high value of x for mercurial ointments be taken to denote a preparation obtained from rancid fats, or if the number be very great, the presence of turpentine.—Ann. chim. applicata; through Chem. Abstracts, 11 (1917), 2598.

Fats.—*Technical Value of the Varrentrapp Reaction.*—W. Schrauth discusses the conversion of unsaturated fatty acids into saturated ones, by the Varrentrapp process of melting the fatty acid with an excess of alkali. Thus oleic acid is converted into palmitic acid by the following reaction:



Varrentrapp published this method a number of years ago and at that time, for several reasons, the process was technically unfeasible. Now, however, it is entirely practical, particularly for the conversion of the ill-smelling fish oil acids (notably clupanodonic acid, $\text{C}_{18}\text{H}_{28}\text{O}_2$) into solid odorless acids. Technically the process is carried on by introducing into an autoclave of 5000 liters capacity, 2500 kilos of the fatty acids from fish oil, 700 to 800 kilos of sodium hydroxide which has been previously dissolved in an equal volume of water. The mixture is heated, with not more than 10 atmospheres pressure, to 200° to 260° during six hours, after which the hot fluid is forced into a pan and worked into marketable soap.—Deutsche Parf. J.; through Chem. News, 115 (1917), 114.

Purified Lard.—P. Carles discusses the preparation of purified lard for use as a pomade base, emphasizes the importance of the proper selection of the crude material, double rendering with a small quantity of water and filtering through suitable fabric and paper. A product thus prepared is said to keep unimpaired for years.—Rept. pharm.; through Chem. Abstracts, 11 (1917), 2943.

Linseed Oil.—*Effect of Heat and Oxidation upon.*—J. A. Newton Friend says that the density and coefficient of expansion of linseed oil are decreased while viscosity and molecular weight are increased by action of heat and oxidation.—Chem. and Drug., 89 (1917), 271. (K. S. B.)

Oils and Fats.—*In Germany.*—In February, 1915 the "War Committee for Vegetable and Animal Oils and Fats" was formed to control the just distribution of all existing stocks. The industrial world was called upon to assist to the utmost by employing substitutes wherever possible; the apothecaries, druggists and chemists agreed to a system of rationing their supplies; and a similar restriction was adopted by the Catholic Church as to illuminating and sacramental oils. The most difficult problem of all was the restriction of these materials as food. Fatless days were introduced, the consumption of fats in kitchens and restaurants was curtailed, the use of cream was forbidden and many other similar orders were issued. Germany also found substitutes for all the soap-making fats and oils, excepting a bare 7 per cent., which effected a great economy, although resulting the "war soap" is not to everybody's taste.

Many acres of land were sown with sunflowers, poppies and other oil acid plants. Beech nuts and other oil-bearing products of field and forest were systematically gathered; mostly by school children. A further rich source of supply was discovered in maize shoots and sprouting rye and barley. To all these methods comes the recovery of oils from the seeds of weeds and trees, fish and even drainage sediments.—Sc. Am., May 26, 1917, 518. (O. R.)

Oils of Maritime Animals.—*Color Reaction of.*—M. Tortelli and E. Jaffé give the following reaction for identifying oils of maritime animals. To a mixture of one mil of the oil, 6 mils of chloroform and one mil of glacial acetic acid, 40 drops of a 10 per cent. solution of bromine in chloroform are added. A transient red color changing to an emerald-green is developed, the color reaching its greatest intensity after one hour. For hydrated oils of this kind it is recommended to mix 5 mils of the oil with 10 mils of chloroform, one mil of glacial acetic acid and 2.5 mils of the bromine solution. Vegetable oils under the same conditions remain at first colorless, then a yellow color is developed changing to yellowish brown and

finally to dark brown. With fats of land animals a yellow or brownish color is produced, only at times a transient green color, which, however, is decidedly different from the emerald-green color produced in fish oils. By this reaction the presence of as little as 5 per cent. of fish oils in vegetable oils and fats can be detected.—Hyg. Rundschau; through Pharm. Weekblad, 54 (1917), 58. (H. E.)

Oils.—*Refining with Permanganate.*—It is stated that since pale colored oils are considered better than dark ones the following process is employed for olive and other oils: A kilogramme of potassium permanganate in the form of small crystals is dissolved in 10 liters of water. This solution of a deep purple color, is mixed gradually with 30 kilos of the oil to be refined and stirred repeatedly as smoothly as possible during a period of two days. At the end of this time there are added 20 liters of water and 5 liters of commercial hydrochloric acid at 20 to 22 degrees Baumé and it is stirred again energetically. Several days later the acidulated water is carefully decanted. To remove all trace of the acid it is treated with clear, warm water and as a final operation is passed through a charcoal filter.—Por. Essos. Memdos; through J. Am. Pharm. Assoc., 6 (1917), 136. (H. H. S.)

Oils, Waxes and Fats.—*Determination of Unsaponifiable Matter in.*—By adopting a definite concentration of alcohol and ether before extraction, best obtained by the use of a double-normal alcoholic potash for hydrolysis, the formation of emulsions in the estimation of the unsaponifiable matter in oils, waxes and fats may be entirely prevented, and the determination completed in thirty minutes after saponification. The trouble experienced in the analysis of beeswax and other waxes, wool-fat, etc., may be eliminated by using 0.5 Gm. of the wax and 4.5 Gm. of castor oil, extracting as usual and making a correction for the unsaponifiable matter in the castor oil.—Chem. and Drug., 89 (1917), 437. (K. S. B.)

Oleins.—*For making Pharmaceutical Preparations.*—The scarcity of fats in Germany has led to experiments to find substitutes for these commodities. In the Apotheker Zeitung the following methods are given for making pharmaceutical preparations with oleins instead of fats. *Soft soap:* 500 grammes of oleic acid and 670 grammes of 15 per cent. caustic potash solution are heated

on a water-bath with constant stirring until saponification has taken place, 50 grammes of alcohol and 200 to 300 grammes of water are then added and the mixture is heated again until a uniform transparent mass is obtained. Yield, 1250 grammes. *Lead Plaster*: 500 grammes of oleic acid are heated on a water-bath with 200 grammes of lead oxide. Since the plaster thus prepared is rather crumbly, it is preferable to incorporate into it 25 grammes of liquid paraffin. *Mother Plaster*: 500 grammes of oleic acid are heated in a copper kettle with 202 grammes of minium until the mass has become brown. The plaster is then kneaded under water until it has lost its stickiness and is then mixed with 100 grammes of yellow wax, 6.6 grammes of camphor and 20 grammes of liquid petrolatum.—Apoth. Zeit.; through Pharm. Weekblad, 54, (1917), 339. (H. E.)

Oleomargarine.—*Water Content of.*—K. Brauer calls attention to the already well-known fact that hydrogenized fats hold a greater amount of water than do ordinary oils and fats. He also states that this water is not readily removed by kneading the mixtures. He has found margarine, prepared from hydrogenized fats, frequently to contain as high as 20 per cent. of water.—Z. öfent. Chem.; through C. U. C. P. Al. J., 24 (1917), 87. (G. C. D.)

Olive Oil.—*Production in Portugal.*—The 1916-1917 production of olive oil in Portugal was 16,150,149 liters.—Chem. and Drug., 89 (1917), 1050. (K. S. B.)

Olive Oil.—*Production in Spain.*—Spain produced 207,115 metric tons of olive oil in 1916 against 326,108 metric tons in 1915 and 207,765 metric tons in 1914.—Chem. and Drug., 89 (1917), 543. (K. S. B.)

Olive Oil.—*Rapid Purification of Rancid Samples.*—Cordier and Lesure find that the method of the Codex for purifying rancid oil (shaking out the free acid with alcohol) is unsatisfactory, as only about 30 to 35 per cent. of the total free acid is eliminated, even by two washings. This is due to the fact that the free acid is as soluble in the oil as it is in the alcohol. The authors found that the free acid can be effectively removed by neutralizing the oil with alkali in the presence of alcohol (in which the resulting

soap is quite soluble) removing the alcoholic layer, then heating the oil to remove the rest of the alcohol and then filtering to remove the last traces of soap. The resulting product is almost free from disagreeable odor and can be used for making camphorated oil for injections.—J. pharm. chim., 15 (1917), 369.

Olive Oil.—*Purification of.*—Discussing the foregoing paper, Astruc and Cambe claims for their former assistant, E. Collard, a degree of priority for some of the conclusions reached by Cordier and Lesure. In 1909, Collard published a paper on the purification of olive oil in which he likewise criticized the purification process of the Codex.

Astruc and Cambe also think that the Cordier and Lesure method could be improved by shaking the neutralized oil with a mixture of equal parts of alcohol and ether rather than with alcohol alone.—J. pharm. chim., 16 (1917), 241.

Olive Oil.—*Purification of.*—P. Le Naour commenting on the Cordier and Lesure paper, points out that considering the present cost of alcohol, the process suggested by them will be quite costly. He recommends the process devised in 1895 by Chief Naval Pharmacist Rouhaud. The process, which he quotes in full, consists of neutralizing the rancid oil with the proper amount of sodium carbonate (previously determined by titration of the oil) dissolved in one-tenth its weight of water by heating to 40°; mixing this solution with the oil previously heated to 40°, shaking the mixture vigorously and finally separating the oil from the aqueous layer only after the mixture is completely cool and sharply layered. It is sometimes well to add some sodium chloride to the mixture to insure proper salting out.—J. pharm. chim., 16 (1917), 243.

Olive Oil.—*Uses.*—The enthusiasm recently evinced for advertising mineral oils for the treatment of chronic constipation has led to a reconsideration of the value of olive oil, which was suggested years ago for the treatment of disorders arising from this cause. A number of cases have lately been recorded in the "New York Medical Journal," in which olive oil has been prescribed with excellent results for the treatment of poor nutrition resulting from chronic constipation. In the treatment of gastric ulcer, fissures, hyperacidity and pyloric spasm, olive oil has proved to be greatly

superior to silver nitrate, or to bismuth and belladonna administered over long periods. Its action is absolutely harmless, mild and strictly local, and its combination of nutritive and aperient action, which is absent in bismuth therapy, renders this simple remedy a most valuable adjunct to the treatment of gastric ulcer. Its nutritive qualities are not the least striking instances of its success. Olive oil has probably fallen into disrepute in consequence of the over-advertisement of its supposed powers. The claim that it has efficacy in the treatment of biliary gallstone affections has not been confirmed by the latest experiments.—Med. Press.; through Pharm. J., 98 (1917), 275.

Orange-Pip Oil.—At a meeting of the Society of Public Analysts, Dorothy G. Hewer gave analytical figures for a sample of bitter orange-pip oil, extracted by means of petroleum ether from a commercial sample of the pips. The only published figures for this oil seem to be those of R. Meyer (Chem. Zeit., 1903, 958), given by Lewkowitsch, and these are not altogether confirmed. The commercial utilization of the oil is discussed.—Pharm. J. Supp., June 16, 1917, 16.

Oil of Orris.—E. J. Parry found that nine samples obtained from different sources showed great variation in physical constants, as follows: Melting points, 34° to 50°; acid value, 118.8 to 217.6; and saponification value, 174.8 to 244.4.—Perf. Essent. Oil Record; through Chem. Abstracts, 11 (1917), 3379.

Palm Oil.—*Methyl Nonyl Ketone in.*—A. H. Salway states that palm oil cannot be used as a dietetic unless it is first deodorized. On the large scale this is effected by steam distillation. The author, having a large quantity of the volatile odorous by-product available at Port Sunlight, has examined it and proved that the main constituent is methyl nonyl ketone. The amount of yellow odorous essential oil amounts to 1.2 per cent. of the original fat. This has the sp. gr., 0.842 at 20°; acid value, 30; saponification value, 15; iodine value, 93.2. The strong, not unpleasant odor recalled that of oranges. After removing the 12.2 per cent. of volatile fatty acids present, which were those previously known to occur in palm oil, the neutral essential oil remaining was found, on fractionization under reduced pressure, to contain 90 per cent.

of methyl nonyl ketone.—J. Chem. Soc.; through Pharm. J., 99 (1917), 29.

Plum-Kernel Oil.—Darvas finds that this oil resembles sesame oil in giving the Baudouin reaction. The specific gravity is about 0.918; acid value, 1.8 to 2.1; iodine value, 97.5 to 100.6. The kernels can be used as substitute for almonds for distilling an aqua prunorum in place of aqua amygdalarum. The Hungarian Government recommends the kernels for the preparation of a coffee substitute.—Z. allg. Oesterr. Apoth. Verein; through Pract. Drug., May, 1917, 38.

Stearols.—*Separation from Fats.*—The higher alcohols such as cholesterol, phytosterols, etc., are generally isolated from and identified in fats by means of digitonin with which they form well-characterized crystals. On account of the high price of digitonin, J. J. L. Zwikker carried out a number of experiments in order to find out a substitute for digitonin and found that a solution of freshly glowed lithium chloride in dry pyridine when allowed to act on a solution of the fat in pyridine precipitates the higher alcohols just as well as digitonin. Thus cholesterol which combines with lithium chloride in the proportion 1 : 1 yields needle-like prisms which strongly polarize the light, and melt at about 140°. The reaction is a quantitative one.—Pharm. Weekblad, 54 (1917), 101. (H. E.)

Wool Fat.—*Cetyl Alcohol as a Substitute.*—Believing the water-absorbing property of wool-fat is due to the higher alcohols contained therein, S. Axelrad has attempted to prepare substitute ointment bases in which the wool fat was largely replaced by cetyl alcohol. The cetyl alcohol was prepared by saponifying spermaceti with lime, evaporating the soap to dryness and distilling at a temperature of 340° C., when a 40 per cent. yield of cetyl alcohol was obtained.

A satisfactory ointment base was made by mixing 70 parts of petrolatum, 20 parts of paraffin (m. p. about 60° C.), 10 parts of cetyl alcohol, 5 parts anhydrous wool fat and 100 parts of water. Such a mixture has been kept for 17 months with no change in appearance or working properties.—J. Ind. Eng. Chem., 9 (1917), 1123. (G. D. B.)

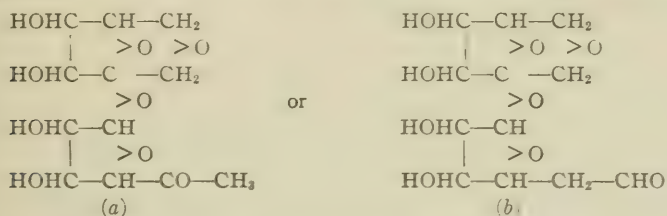
Wool Fat.—*Preparation of Purified.*—O. B. Salisbury describes the manufacture of wool fat in America. He first discusses the cost of pharmaceutical wool fat from 1885, when lanolin was introduced in America at 75 to 85 cents a pound to 1912 when various brands of purified hydrous wool fat were selling at from 20 to 35 cents a pound. At present, wool fat is being made at a woolen mill in Minnesota at a quantity price of 70 cents a pound for the hydrous and \$1.00 a pound for the anhydrous.

The article describes, with illustrations, the wool-washing machine, from which the alkaline emulsion of wool fat is obtained; the centrifuge in which the emulsion is separated as cream and the various devices whereby the alkali is recovered from the wool scouring liquors. Some mention is also made of the chemistry of wool fat.—Pharm. Era, 50 (1917), 279.

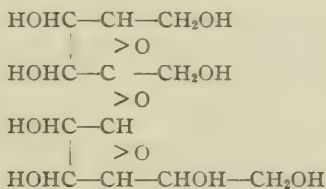
CARBOHYDRATES.

Aldehydic Sugars.—*Assay of.*—J. Bougault describes an iodometric process depending on the fact that aldehydic sugars are oxidized by excess of iodine in presence of sodium carbonate with formation of hydriodic acid and the corresponding monobasic acid, thus: $\text{RCHO} + \text{H}_2\text{O} + \text{I}_2 = \text{RCOOH} + 2\text{HI}$. The reaction is not immediate: in practice about three times the theoretical amount of iodine should be used; with glucose, oxidation is complete in about thirty minutes. The excess of iodine is then titrated in the usual manner with thiosulphate solution. Simultaneously slight secondary oxidations occur. To correct for these an experiment may be run simultaneously with a specimen of pure sugar of the kind being determined, to obtain the correcting factor. The results obtained by this method are very accurate. Ketonic and non-reducing sugars are not sensibly oxidized under these conditions: aldehydic sugars may therefore be determined by the method, in their presence. In the case of non-reducing sugars, such as sucrose, however, the accuracy of the method is influenced by the proportion of these present. When they greatly preponderate over the aldehydic sugar the amount of secondary oxidation interferes with the result. Comparative results may, however, be obtained by checking against controls made simultaneously with the pure non-reducing sugar. Unfortunately the reaction mixture has affinities for other organic substances besides the aldehydic sugars; hence its practical application is limited.—Compt. rend.; through Pharm. J., 99 (1917), 123.

Caramel.—*Chemistry of.*—Cunningham and Doree at a meeting of the Chemical Society stated that the investigations of caramel from a chemical standpoint, on account of the infusible and non-crystalline nature of the various constituents, and the great tendency of them to form colloidal solutions, meets with difficulties but previous workers have obtained three compounds, *viz.*, caramelan, caramelen, and caramelin. Caramelan, which has a close connection with cellulose and humus by yielding similar decomposition products, has the formula $C_{12}H_{18}O_9$. The authors obtained caramelan in large quantities as a buff colored powder, melting at $136^\circ C.$, by heating cane sugar to 180° for some time, when only water was evolved, precipitating the gummy substances from aqueous solution with alcohol and subsequent precipitation with glacial acetic acid. Its reducing action in presence of phloroglucinol and resorcinol indicates the presence of four hydroxyl groups, and caramelan may, therefore, be represented by one of two formulæ:



which are based on Fischer's formula for cane sugar:



The acetate, benzoate and the tetranitrate, which resembles the nitro-celluloses by its inflammability, have marked reducing properties but experiments on molecular weights were not conclusive, caramelan in water giving a value between 400 and 600, the acetate a value of 972, while the benzoates showed three times the normal figure. Phenylhydrazine, hydroxylamine, and semicarbazide were used to examine the ketonic character; with phenylhydrazine the red precipitate was abnormal, having the composition $C_{15}H_{24}N_2O_8$, and in presence of acetic acid a compound having the formula $C_{30}H_{38}O_{16}N_2$

was obtained. Experimental work on the hydrolysis by acid, carried out with the object of ascertaining whether ceramelan gave rise to simple sugars, showed interesting results. Three per cent. hydrochloric acid formed humic acid, $C_{24}H_{22}O_{11}$, similar to that obtained from the humus of the soil, and 7 per cent. nitric acid produced a nitro-derivative, $C_{23}H_{23}O_{14}N$, which was also obtainable from humic acid. Hydrochloric acid of 12 per cent. concentration, employed under conditions similar to those for the production of furfural from pentoses, yielded a yellow amorphous chlorine compound, $C_{24}H_{29}Cl_3O_{18}$, while fuming acid produced gelatinization. Water-soluble acids are formed by the action of oxidizing agents, such as potassium permanganate, potassium dichromate, etc., and 70 per cent. nitric acid resulted in some interesting insoluble acid in addition; bromine water formed substituted acids with loss of one carbon atom, whereas caramelan becomes, with ozone, opaque and decolorized, suggesting the presence of unstable peroxides, but, on boiling, the color is restored, and on distillation aldehyde is evolved.—Pharm. J., 98 (1917), 408.

Carbohydrates.—*Determination in Mixtures.*—J. N. Kolthoff reports on a method of detecting sugars found in mixtures. The method which he proposes is the following:

One gramme of the mixture is shaken for some time with 10 mls of 80 per cent. alcohol. The mixture is then filtered and the insoluble portion is washed with about 5 mls of 80 per cent. alcohol. The solution contains saccharose, fructose and glucose. Saccharose is detected by inversion. Fructose in the presence of saccharose is detected by Seliwanoff's or Ihl-Pechmann's method and in the presence of saccharose and glucose by Luff's reaction, at 37 to 40°. Glucose in the absence of fructose is determined as glucosazon and in the presence of fructose by Riegler's reaction. The insoluble part which contains lactose, dextrin, gum, starch and cellulose is treated with water which dissolves lactose, gums and dextrin. Lactose is estimated as lactosazon and by DeGraaf's mucic acid reaction. Gums are precipitated with basic lead acetate solution and with the precipitate the phloroglucin test with hydrochloric acid is made. Dextrin is detected by iodine or precipitated with equal volumes of lead acetate solution and alcohol and inverting the precipitate with strong hydrochloric acid into glucose. Undissolved are starch and cellulose. The former is identified by iodine, the latter is identified by its solubility in

cupric-ammonium chloride solution or by the phloroglucin test with hydrochloric acid.—Pharm. Weekblad, 54 (1917), 206. (H. E.)

Cellulose.—*Manufacture from Seaweed.*—A patent has been granted to an Italian inventor for a process for the production of cellulose pulp, for paper manufacture, from seaweed.—Chem. and Drug., 89 (1917), 350. (K. S. B.)

Cellulose and Chemical Industry.—C. F. Cross, who with his colleague, E. J. Bevan, are authors of a standard book on paper-making, points out the importance of cellulose, both cotton and wood pulp in chemical industry. Cellulose is not found pure in nature but in the fibro-vascular tissue of wood or leaves, which are freed from the fleshy parts by treating with alkali or acid. Esparto grass is thus treated when used as the source of wood-pulp in paper-making. In pulping wood direct, sulphurous acid in the form of the bisulphite has found extensive use. The end-products produced from cellulose vary as to the methods of treating the raw material. As a result of destructive distillation of wood we have acetic acid, acetone and wood spirit used in the manufacture of explosives. Synthetically, we have the nitrate (gun cotton), by treating cotton with nitric acid, the basis of explosives; the acetate, which, because it is water-resisting and a preservative, is widely used in treating the planes of aeroplanes to render them taut and more enduring. Another great industry is the mercerization of cotton, which consists of treating cotton with a caustic soda solution, neutralizing with acid, washing, and stretching the cotton to avoid shrinking; the finished product is a material having a lustre equal to satin or silk. Cross also states the result of burning vegetable matter is ash; cellulose impregnated with metals and so treated gives a skeleton. This has been used in the incandescent gas mantle industry where silk is impregnated with thorium and cerium; burn away the silk and the metals retain the skeleton form.—Chem. and Drug., 89 (1917), 252. (M. O'C. D.)

Cellulose.—*Beet Pulp a Substitute for Cotton.*—The fibrous part of beet pulp, a refuse in the manufacture of sugar, is nearly all pure cellulose. As such it is an excellent article in the manufacture of nitrocellulose, especially of smokeless gunpowder. As the beet pulp is in as fine a condition as needed to make powder, the mechan-

ical processes of pulping wood, for instance, can be saved. Inasmuch as cotton is scarce, especially in Germany, it is supposed that this refuse beet pulp is utilized for this purpose.—*Sc. Am.*, June 9, 1917, 575. (O. R.)

Disaccharides.—*Action of Formaldehyde on.*—Heiduschka and Zirkel report on their study of the action of formaldehyde on lactose, maltose and saccharose. They have come to the conclusion that a series of complex bodies are formed rather than characteristic compounds. These complexes contain about 39 per cent. of formaldehyde and are apparently solid solutions of formaldehyde in the carbohydrate in question.—*Arch. Pharm.*; through *J. pharm. chim.*, 16 (1917), 248.

Disaccharides.—*Synthesis of Food.*—Wrede obtained the octaacetates of disaccharides with one of the oxygen atoms being replaced by sulphur or selenium if potassium sulphide or selenide acted upon alcoholic solutions of β -acetobromodextrose. On hydrolysis with acids hydrogen sulphide or selenide and a reducing sugar are formed and on hydrolysis with alcoholic ammonia the acetyl groups are split up and the disaccharides are obtained. The sugars are only very slightly toxic, are very resistant to the action of enzymes and, for reasons explained in the original article, are named: thio- and seleno-isotrehalose.—*Biochem. Z.*, 83 (1917), 96; through *J. Chem. Abs.* (A. V.)

Gentiobiose.—*Alpha and Beta Derivatives of.*—Hudson and Johnson continuing their study of alpha and beta glucose and of its compounds, turned to those disaccharides, which on hydrolysis yield glucose only. Of these, maltose and cellose have been studied considerably, so the authors investigated the third member of the group, gentiobiose. Zemplen had already extracted alpha-gentiobiose in the form of an octacetate directly from gentian root and Hudson and Johnson not only repeated Zemplen's work, but also devised a method whereby the yield of the octacetate from 1.2 to 10 grammes per kilo of dry root, obtaining as much as 425 grammes of the substance.

They were also able by treatment of the alpha octacetate with zinc chloride and acetic anhydride to convert it into the beta octacetate.—*J. Am. Chem. Soc.*, 39 (1917), 1272.

Glucose.—*In Jam Making.*—Production Leaflet No. 4 of the Board of Agriculture deals with the use of glucose, or of mixtures of glucose and sugar in jam making.—Chem. and Drug., 89 (1917), 751. (K. S. B.)

Glucose.—*Objections to Use in Pharmaceuticals.*—As commercial glucose usually contains varying amounts of sulphur dioxide, W. B. Cowie states that it can only be used as a sugar substitute in preparations of neutral reaction. In acid mixtures, especially compound syrup of hypophosphites, the trace of sulphur dioxide present is reduced to sulphur with liberation of hydrogen sulphide. This reaction may cause color changes in many galenicals. A test for sulphur compounds in sugar and glucose may be applied as follows: To 10 Gms. of the substance dissolved in sufficient distilled water to make 50 mls, add 1 Gm. of sodium hypophosphite, followed by 10 mls of concentrated phosphoric acid (1 : 5); tightly stopper and set aside in a warm place for a few hours. The usual sulphur compounds will be perceptible by the odor noted upon opening the container. It should be noted that the odor of hydrogen phosphide may easily be mistaken for that of hydrogen sulphide and that aniline coloring materials may give an odor of hydrogen sulphide upon applying the above test. Commercial samples passing the test of the British Pharmacopœia for sulphur dioxide in glucose, even when employed in small amounts, will in acid mixtures cause color changes and develop objectionable odor.—Pharm. J., 98 (1917), 235. (C. W. B.)

Gun Cotton.—*Manufacture of.*—I. L. B. van der Marck reports that the nitration mixture given in the Dutch Pharmacopœia for making gun cotton consisting of 400 parts of crude nitric acid (61.27 per cent. HNO_3) and 1000 parts of crude sulphuric acid (95 per cent. H_2SO_4), representing 17.5 per cent. of HNO_3 , 67.85 per cent. of H_2SO_4 and 14.65 per cent. of water, should be replaced by a mixture containing 16 per cent. of HNO_3 , 65 per cent. of H_2SO_4 and 19 per cent. of H_2O . Cotton (500 Gm.) treated with 30 kilos of this mixture at 20° to 22° for $4\frac{1}{2}$ hours yielded 750 Gm. of gun cotton which was easily soluble in ether-alcohol, acetone, amyl acetate, etc., forming with these solvents colorless solutions.—Pharm. Weekblad, 54 (1917), 53. (H. E.)

Keto-hexoses.—*Detection with Thiobarbituric Acid.*—G. P. Plaisance dissolves the keto-hexose in 12 per cent. hydrochloric acid, boils the mixture then cools it and then adds a few drops of a solution of thiobarbituric acid in 12 per cent. hydrochloric acid. An orange-colored precipitate occurs when keto-hexoses are present, whereas aldo-hexoses give only a yellow solution.

It is important that the reacting fluid be 12 per cent. hydrochloric acid. If stronger, aldoses form compounds yielding slight precipitates.—J. Biol Chem.; through J. pharm. chim., 16 (1917), 381.

Levulose.—*Determination of.*—L. Loewe describes a method for the determination of levulose in presence of dextrose, as follows: To the solution to be tested, after boiling, are added a 0.2 per cent. solution of orcein, and 85 per cent. solution of phosphoric acid, a yellow coloration being noted. This becomes orange after addition of an alkali. In order to make quantitative determinations, colorimetric comparisons are made with a standard solution of levulose treated with the like reagents. The presence of sucrose acts as a disturbing factor, as this is hydrolyzed by the acid. The test is a delicate one, levulose being detected in 1 mil of a 0.05 per cent. solution.—Proc. Soc. Exp. Biol. and Med.; through C. U. C. P. Al. J., 24 (1917), 102. (G. C. D.)

Milk Sugar.—*Determination in Headache Powders.*—R. Miller outlines a rapid method for an approximate determination of milk sugar in headache powders, which depends upon the fact that milk sugar, when heated with ammonium hydroxide, gives a yellow to red color. The intensity of the color is used as a measure of the amount present.—Am. J. Pharm., 89 (1917), 154. (R. P. F.)

Monosaccharides.—*New Hydrazones of.*—A. W. van der Haar has prepared the following:

Levo-arabinose para-tolylhydrazine; colorless prismatic needles, melting at 160°.

Rhamnose para-tolylhydrazone; colorless leaflets, melting at 166°.

Mannose para-tolylhydrazone; melting at 190° to 191°.

Fucose para-tolylhydrazone; long colorless needles, melting at 169°.

Dexter-galactose para-tolylhydrazone; colorless prisms, melting at 168°.

The original paper is illustrated with microphotographs of the hydrazones just mentioned.—*Rec. trav. chim. des Pays-Bas*; through *J. pharm. chim.*, 16 (1917), 383.

Mycodextrane.—*A New Polysaccharide.*—From *Penicillium expansum*, Dox and Neidig have extracted the new carbohydrate, mycodextrane. It is closely related to the substance extracted by Beltz from the spores of *Elaphomyces granulatus* and erroneously called "mycoinulin." Mycodextrane swells in cold water and dissolves to a clear solution on heating, from which it is reprecipitated on cooling. It is readily soluble in sodium hydroxide solution and in hydrochloric acid, but not in ammonium hydroxide, acetic acid nor sodium carbonate solution. It is precipitated from its sodium hydroxide solution by passing in a current of carbon dioxide. The hot aqueous solution is not precipitated by tannin nor by lead acetate; it is not colored by iodine; its tenth-normal sodium hydroxide solution has an optical rotation of $+251^\circ$. By acid hydrolysis it is converted entirely into glucose. Amylolytic enzymes do not act on mycodextrane. It resembles the carbohydrate of Iceland moss but has a different rotary power. It differs from Winterstein's para-isodextrane by giving no blue color with iodine.—*J. Biol. Chem.*; through *J. pharm. chim.*, 15 (1917), 348.

Nulomoline.—*Uses.*—Nulomoline, an inverted cane sugar, is suggested as a substitute for glucose, especially in non-drying tooth pastes, etc. It is sweeter than glucose.—*Chem and Drug.*, 89 (1917), 528. (K. S. B.)

Guttapercha Paper.—*Substitute for.*—According to a German patent granted to G. Muenzel, paper which is impermeable to water like guttapercha paper, but is considerably cheaper than this, is made by impregnating long fibered paper with a 5 per cent. potassium acetate solution and then treating the still somewhat moist paper with a solution of an aluminum salt of a fatty acid and finally applying a suitable varnish.—*Chem. Zeit. Uebersicht*; through *Pharm. Weekblad*, 54 (1917), 217. (H. E.)

Pectin.—*Constitution and Properties of.*—G. Trier gives a summary of a recent work done in this difficult field of chemistry. He cites Ehrlich's investigations showing that pectins appear to be the calcium magnesium salts of a complex acid, anhydroarabino-

galactosemethoxytetragalacturonic acid; that galacturonic acid is a constant constituent of the pectins of most plants, as well as of vegetable mucilages, such as tragacanth and cherry gum. From the pectin of beets, Ehrlich obtained 9 per cent. of methyl alcohol, from the methoxy compound mentioned above. Von Fellenberg discusses the production of methyl alcohol from pectin, finding that beverages made from the marc of fruits frequently contain appreciable quantities of methyl as well as ethyl alcohol.—Schweiz. Apoth. Ztg.; through J. pharm. chim, 16 (1917), 339.

Reducing Sugars.—*The End-Point of the Fehling Assay.*—A. B. Lyons repeats a trick of manipulation taught him as a student; hence “not new but worth knowing,” as he puts it. If to the mixed Fehling solution prior to titration with the sugar solution, 0.5 to 1.0 gramme of calcium carbonate is added, the end-point can be easily noted because of the fact that the calcium carbonate quickly carries down the cuprous oxide, leaving a clear supernatant fluid in which the end-point, the disappearance of the blue color, is certain and sharp. Dr. Lyons also emphasizes the need of rapidity in a Fehling assay, as the reabsorption of oxygen from the air interferes with the accuracy of the process.—J. Am. Pharm. Assoc., 6 (1917), 553.

Sugar.—*Manufacture from Beets in France.*—W. A. Poucher, a pharmacist in the Royal Army Medical Corps in France, describes the manufacture of beet sugar as seen by him just back of the battle front. He divides his paper into seven headings: (a) preliminary treatment of the beets; (b) preparation of the solution; (c) purification of the solution; (d) concentration to thick syrup; (e) boiling to crystallization; (f) crystallization; (g) separation of the molasses. For these details, the original paper should be consulted.—Pharm. J., 98 (1917), 467.

Sugar.—*World's Supply.*—According to a bulletin of the U. S. Department of Agriculture, sugar is derived annually from over 12 million acres, the acreage being about equally divided between cane and beets. The yield of beet sugar per acre has ranged between 18 and 39 hundred pounds, while that of cane sugar has ranged between 20 and 90 hundred pounds. During the decade from 1904–13, the United States led all other countries in the amount of sugar imported and consumed, but not in per capita

consumption, in which Australia leads with almost 113 pounds.—*Sc. Am.*, Aug. 11, 1917, 95. (O. R.)

Sugars.—*Assay in the Presence of Gums.*—G. Savini finds that the official Italian and German methods for determination of sugars in presence of gums are faulty, and the results obtained inaccurate. Both of these methods seek to remove the gums by treatment with lead subacetate and the subsequent removal of the excess of lead by treatment with either sodium sulphate, carbonate or phosphate. The author claims that the gummy matter is not entirely removed, and recommends the employment of lead acetate and alcohol, as proposed originally by Chauvin, for the determination of gum in syrupy liquids. A mixture consisting of 70 mls of 95 per cent. alcohol and 10 mls of solution of lead subacetate (gradually added) is mixed, with agitation, with 20 grammes of the sample under consideration, dissolved in 110 mls of water. After standing for about one hour, the liquid is diluted to 200 mls (making due allowance for the precipitate volume), and then filtered. Of this filtrate 100 mls are neutralized with acetic acid, and most of the alcohol expelled by evaporation, after which water is added to make up the original volume of 100 mls. A small quantity of alum is used to precipitate the excess of lead. The resulting lead sulphate is removed by filtration, and the sugar determined in the clear liquid by the customary methods.—*Ann. chim. applicata*; through *C. U. C. P. Al. J.*, 14 (1917), 64. (G. C. D.)

Sugars.—*Assay of.*—After reviewing the various methods, in which no potassium iodide is used, recommended for estimating sugar especially in urine, N. Schoorl and I. M. Kolthoff report on experiments carried out with Brahm's method in which the amount of potassium iodide is reduced to a minimum, only about one-tenth of that generally employed in iodometric sugar determinations. To a mixture of 25 mls each of Fehling's copper solution and Fehling's Rochelle salt solution, the sugar solution under examination and sufficient water are added to obtain 125 mls. The mixture is boiled for 2 minutes and after cooling transferred with the aid of 100 mls of cold water to a 250 ml measuring flask and the volume made up with water to the mark. After mixing well and allowing to settle 50 mls of the supernatant clear liquid are pipetted off, mixed with 200 Mg. of potassium iodide and 5

mils of 25 per cent. sulphuric acid and the liberated iodine is titrated with a *N*/10 potassium sulphocyanide solution prepared by dissolving 20 to 25 Gm. of potassium sulphocyanide and 14.8 Gm. of sodium thiosulphate in sufficient water to obtain 1000 mils. The method can be used for sugar solutions which have been purified by means of lead acetate, since the lead iodide is converted by the sulphuric acid into lead sulphate. The thiosulphate is added in order to prevent the oxidation of the sulphocyanide by the iodine. The method gives just as accurate results as Mohr's oxidimetric method with potassium permanganate, modified by Schoorl and Regenbögen.—*Pharm. Weekblad*, 54 (1917), 949. (H. E.)

Sugars.—*Auto-oxidation of.*—Berczeller and Szegoe studied the influence of various substances added to an alkaline sugar solution on the rate of oxidation, finding that such substances as methylene blue promote oxidation. The influence of tartrates and other substances on the oxidation of sugar in alkaline copper solutions was also studied.—*Biochem. Z.*, 84 (1917), 1; through *J. Chem. Soc. Abs.* (A. V.)

Sugar.—*Danger in Use as Wound Dressing.*—J. P. Simonds says that while theoretically sugar should prove a useful ingredient in the dressings for ordinary infected wounds, this is not the case when *Bacillus perfringens* is present. The presence of cane sugar in any proportion below 40 per cent. in wound secretions converts them into a most favorable medium for the growth of this organism. Consequently, when there is any possibility of infection with this gas gangrene bacillus, no saccharine matter should be present in any solutions used on the wound.—*Pharm. J.*, 98 (1917), 48.

Starch.—*Direct Assay of.*—Th. von Fellenberg reports on a method based on the methods originated by Mayrhofer and Baumert in which the starch is dissolved in a 50 per cent. calcium chloride solution by which a colloidal solution is obtained, from which the starch is reprecipitated by iodine solution. The starch (0.3 to 1 Gm.) is deprived of the fat by extraction with alcohol and ether, is dried and heated on a water-bath for one-half hour with 20 mils of a 50 per cent. solution of anhydrous calcium chloride. The mixture is then heated to boiling for five minutes, cooled and sufficient water is added to obtain 100 mils. The liquid is then

filtered first through cotton and then through asbestos and to an aliquot part of the filtrate $N/50$ iodine solution is added as long as a precipitate is produced, avoiding an excess of the precipitant. The precipitant is then collected in a Gooch crucible, washed first with a 5 per cent. calcium chloride solution, then with hot diluted and strong alcohol until it has become colorless, and is then dried to constant weight. The crucible is then heated to red heat and the residue weighed. By subtracting this weight from the weight of the washed precipitate the amount of starch present in the sample is obtained.—Mitt. Labens m. Hyg.; through Pharm. Weekblad, 54 (1917), 339. (H. E.)

Starch-Like Substances.—*Formation by Molds.*—Boas reports that *Aspergillus niger* in the presence of mineral acids produces in the culture medium from glycerol and mannitol a substance giving the blue iodine reaction. Oxalic, succinic, malic and especially tartaric and citric acids being used as source of carbon, also produced the same substance in fairly high concentrations; the substance, however, tends to disappear after some time.—Biochem. Z., 81 (1917), 80; through J. Chem. Soc. Abs. (A. V.)

Starch Iodide.—*Use as Wound Dressing.*—A. Lumiere comments upon the desirability of using an agent in the treatment of infected wounds, which will not be destroyed in quick order by the tissues and which will retain its activity for a period of at least several days. His experiments showed that 10 grammes of muscle tissue showing traces of beginning decomposition, completely decolorized 25 milligrammes of iodine contained in 100 mls of solution, in about one-half hour, putrefactive changes then taking place rapidly. Under like conditions he found that a quantity of iodide of starch containing the same weight of iodine (25 milligrammes) still retained some of its blue color after the lapse of one month. The author further reports that iodide of starch, containing one part of iodine in 50,000 parts, was capable of destroying *Streptococci*, *B. coli*, and *B. pyocyaneus*, in 24 hours at a temperature of 37° C. A much weaker solution was effective against *Staphylococci*. In dressing wounds obtained in battle, it was found that iodide of starch, containing one per cent. of iodine, would prove very effective, causing such wounds to remain practically sterile for three dressings. The author also states that a solution of iodide of starch containing 0.50 gramme of iodine in each liter, can be

employed in the treatment of wounds by the irrigation method, and that it is quite as effective as Dakin's solution, and entirely non-irritant to tissues.—*Compt. rend.*, 165 (1917), 376; through *C. U. C. P. Al. J.* (1918). (G. C. D.)

Starch-Iodine Complex.—*Formation of.*—Berzceller reports that potassium iodide need not be present to cause the formation of the complex. Starch takes up more iodine at lower than at higher temperatures and the adsorption equilibrium between starch and iodine is reached more rapidly in dilute than in concentrated solution.—*Biochem. Z.*, 84 (1917) 106; through *J. Chem. Soc. Abs.* (A. V.)

Syrup of Grapes.—*Substitute for Sugar.*—The great scarcity of sugar in Italy and the government prohibition of its use in wine making has effectually drawn attention to the sweetening methods employed during the economic crisis of 1790–1800, when it was found that syrup of grapes furnished a fairly satisfactory solution of the problem. Although it cannot take the place of syrup for general purposes, it is an excellent sweetening for jam, marmalade, etc., increasing their nutritive value. It is of utmost importance to use well-matured fruit and to avoid alcoholic fermentation during the process. In order to remove all solid particles and albuminous and pectic substances, it is necessary to use centrifugal force, by means of which 75 per cent. of the deleterious substances can be eliminated from the expressed grape juice. The centrifuged liquid is poor in fermenting elements, and in order to insure its preservation for several months from 100 to 150 Gm. potassium sulphite per 100 hectoliters of liquid may be added. In view of the high cost of potash, the direct system of sulphurization can be used with SO_2 from the combustion of sulphur. This latter process costs only 1 or 2 cents per hectoliter.—*Sc. Am.*, Sept. 15, 1917, 185. (O. R.)

ORGANIC ACIDS.

Glacial Acetic Acid.—*Estimation of Water in.*—The percentage of water in glacial acetic acid is generally determined either by the melting point and congealing point of the acid or by titration with standard alkali solutions. N. Schoorl, while experimenting with Wijs' iodine solution, found that a solubility test can well be used for determining the water in glacial acetic acid. Carbon tetra-

chloride is soluble in water-free acetic acid in all proportions but not if the acid contains water. This can still better be shown by adding as much iodine to the acid to obtain a color corresponding to that of 0.01 normal iodine solution. When the acid is mixed with an equal volume of carbon tetrachloride the mixture is still colored yellowish brown, when the proportion of acid to carbon tetrachloride is 1 : 2 a violet-brown color is produced, the color changing more to violet the more carbon tetrachloride is added until finally when the proportion of the two liquids is 1 : 5 a pure violet color is obtained. When, however, water is present the color change is retarded (the violet-brown color is produced only after the addition of 3 volumes of tetrachloride) and two layers are gradually formed, the upper of which exhibits a yellowish brown color, while the lower is colored violet. Up to 5 per cent. of water in glacial acetic acid can be found by this method, the results being accurate within about one per cent. Carbon disulphide and chloroform were found to be unsuitable for this purpose.—Pharm. Weekblad, 54 (1917), 945. (H. E.)

Vinegar.—*Reducing Substance in.*—R. W. Balcom finds that the volatile reducing substance found in the distillate of cider vinegar consists wholly or at least in large part of acetylmethylcarbinol, $\text{CH}_3\text{CHOH.CO.CH}_3$. It is also shown that this substance is a normal constituent of cider vinegar. Diacetylphenylosazone was prepared from the distillate, and identified as such. It was also established that this substance had its origin in the carbinol and not in the acetoacetic acid present.—J. Am. Chem. Soc., 39 (1917), 309. (G. C. D.)

Vinegar.—*Clearing.*—Vinegar may be cleared by adding 1.5 ounces of fresh milk per gallon, shaking, setting aside for 24 hours and pouring off the clear portion.—Chem. and Drug., 89 (1917), 852. (K. S. B.)

Vinegar.—*Use in Typhoid.*—Three or four years ago Loir pointed out that the addition of 20 mls of vinegar to a liter of water kills all bacteria in it, including those of the *B. typhosus* group. The same occurs when the water is mixed, half and half, with acid wine. This confirms the results obtained by R. G. Alvarez in forty years' practice, during which he has given typhoid

and paratyphoid patients an abundance of acid drinks. He attributes his success mainly to this treatment. Formerly lemonade or diluted wine was used, but later, vinegar water or hydrochloric acid lemonade has been employed. Mortality in his cases has been low, and always from complications.—Sigio Medico; through Pharm. J., 98 (1917), 353.

Acetylsalicylic Acid.—*Some Salts of.*—M. Bouvet describes the following compounds:

Sodium acetylsalicylate may be obtained by a modification of Richter's patent. A solution or suspension of acetylsalicylic acid in methyl alcohol, containing a little water, is treated with the theoretical equivalent of sodium carbonate. An excess of ether is then added, which precipitates the sodium salt. This is collected, drained, and dried at 40° C. The white salt thus obtained melts at 218° C. with decomposition. It is very hygroscopic and unstable, liberating acetic acid as soon as prepared, and rapidly hydrolyzed on contact with water into sodium salicylate and acetic acid. *Lithium salicylate*, known as "hydropyrine L.," "grifa," or "apyrone," has been recommended as a substitute for the more unstable sodium salt. It is, however, hygroscopic, and is difficult to prepare, generally containing not less than 5 per cent. of impurities. It forms prisms containing 0.5 mol. of water. It is hydrolyzed on contact with water, but somewhat less rapidly than the sodium salt. *Calcium acetylsalicylate* is a much more stable salt than the two described above. It is not hygroscopic; is very soluble, giving clear 1 : 20 solutions with water, and these solutions are only slightly acid. It is the best salt for pharmaceutical use for the preparation of cachets or tablets. For this purpose it has been introduced into commerce under the names "soluble aspirine," "kalmopyrine," and "solupyrine." It is best prepared by Mathé's process: Pure lime is slaked with water, suspended in alcohol, and treated with the theoretical amount of acetylsalicylic acid in gradually increasing concentration in alcoholic solution. The pinkish mass obtained is pressed, washed with ether, and dried at 40° to 50° C. Thus obtained it contains 2 mols. of water of crystallization, is readily soluble in water, less soluble in alcohol, and insoluble in ether. It may also be obtained in needles, containing 3 mols. of water. It has a slightly chalky taste. According to Gerngross the use of organic solvents for the preparation of this and similar salts of acetylsalicylic acid is unnecessary;

better results are obtained with aqueous solutions. *Magnesium acetylsalicylate* is easily obtained by agitating together calcined magnesia, 4 Gm.; acetylsalicylic acid, 36 Gm.; and water 189 Gm.; then adding methyl alcohol, and precipitating the salt with ether. Magnesium acetylsalicylate is soluble in water and in methyl alcohol, less soluble in ethyl alcohol. It crystallizes from aqueous solutions in hexagonal tables containing 3 or 4 mols. of water. Among the other little known acetylsalicylates the following are mentioned: *Potassium*, forming tables, m. p. 65° C.; *zinc*, rhombic tables sparingly soluble in water and in alcohol; *copper*, prisms, insoluble in water and in alcohol; *silver*, needles, insoluble in water; and *mercury*, crystallizing from aqueous solutions with 1 mol. of water, m. p. 136° C. with decomposition; from chloroform, it crystallizes in anhydrous prisms, m. p. 142° C. with decomposition. It is claimed for the calcium salt that it does not cause pharyngeal or gastric pain like the free acid, and that it occasions less renal irritation, while it has all the therapeutic properties of acetylsalicylic acid. As much as 5 Gm. is stated to be tolerated for a dose without harm.—Bull. sci. pharm.; through Pharm. J., 98 (1917), 419.

Acetylsalicylic Acid.—*Some Salts of.*—The English holders of the trade marks "hydropyrin" and "kalmopyrin" object to some of the statements made in the foregoing article.—Pharm. J., 98 (1917), 439.

Aspirin.—*Crystals.*—H. F. Slack finds that this chemical crystallized from chloroform, forms three kinds of crystals: a fine needle, a large needle and a flat table form. All fuse at 135° C.—Chem. and Drug., 89 (1917), 1107. (K. S. B.)

Aspirin.—*Tests for and Assays of.*—M. François identifies acetylsalicylic acid by treating 1 gramme of it with two grammes of calcium hydroxide and 10 mls of water. After an hour the compound will have split into water-insoluble calcium salicylate and water-soluble calcium acetate. The latter is identified by evaporating the filtrate, passing the dish containing the residue over a naked flame to decompose traces of salicylates and then applying the cacodyl test, the ferric chloride reaction and the silver acetate test. The salicylate in the lime precipitate is treated with hy-

drochloric acid, the freed salicylic acid is shaken out with chloroform and is identified by the ferric chloride test and by its melting point.

Aspirin has been grossly adulterated in France since the war, and such impurities as sugar and tartaric acid may be detected by the way it decomposes when heated. While acetylsalicylic acid does not give the ferric chloride reaction, an aqueous solution on standing will give it, due to liberation of salicylic acid by hydrolysis. François finds the melting point of pure aspirin nearer 132° than 135° as stated in the Codex. As to an assay, he prefers the Astruc method of titration with normal alkali. He cites two samples of supposed aspirin containing magnesium sulphate, lactose, and only 7.8 to 7.9 per cent. of salicylated products.—J. pharm. chim., 15 (1917), 213.

Aspirin.—Tsakalotos responds to the foregoing paper, emphasizing especially what he said in his previous article (see Year Book, 1916, 353) concerning the salicylo-salicylic acid tests that are made possible by the fusion of the original chemical. He also points out the variability of the melting point of commercial samples of acetylsalicylic acid.—J. pharm. chim., 16 (1917), 336.

Aspirin and Sodium Salicylate.—*Assay in Powders.*—R. Miller gives chemical methods for the separation and subsequent identification of these two chemicals. The aspirin is taken up in ether and the insoluble residue consists of fairly pure sodium salicylate.—Am. J. Pharm., 89 (1917), 347. (I. G.)

Novaspirin.—*Determination when Mixed with Aspirin.*—Reginald Miller outlines an approximate method for determining novaspirin which depends upon the fact that sodium hydrate produces a yellow color with novaspirin, but remains colorless with aspirin. The intensity of color produced is used as the measure of the quantity of novaspirin present.—Am. J. Pharm., 89 (1917), 155. (R. P. F.)

Sodium Benzoate.—*Criticism of Pharmacopœial Standard.*—C. E. Smith points out several of the defects which are doubtless due to oversight in the statement of the standards of purity and strength for sodium benzoate as laid down in the present Pharmacopœia.

These defects are, first, the failure to express explicitly the benzoic acid forming part of the salt to the same strength of purity as that required for benzoic acid itself under its own separate heading; another is the failure to adequately restrict the water content; and still another is the inadequacy of the assay method prescribed.

It is a well-known fact that sodium benzoate can hold as high as 11 per cent. of water without showing it. The author suggests that the final assay method should show whether the salt actually contains the required minimum percentage of benzoic acid.—Am. J. Pharm., 89 (1917), 576. (I. G.)

Calcium Cacodylate.—This salt has been admitted into New and Non-Official Remedies as containing from 43.5 to 48 per cent. of arsenic in the form of cacodylic acid and free from arsenite, arsenate and monomethylarsenate. It has the mild arsenic action of cacodylates. Calcium cacodylate is white, almost odorless, and very soluble in water.—J. Am. Med. Assoc., 68 (1917), 1911. (W. A. P.)

Piperazine Cacodylate.—*Preparation qf.*—A. Astruc finds that one molecule of piperazine combines with two molecules of cacodylic acid to form a crystalline compound. When the operation is carried on in alcoholic solution, the crystallization is rapid and satisfactory. The compound is soluble in water, less so in strong alcohol. It is precipitated from aqueous solution by mercuric chloride, Lugol's solution, picric acid and uranium acetate. It is not precipitated by barium chloride, silver nitrate, potassium dichromate nor ferric chloride. It is acid to phenolphthalein and alkaline to helianthin.—Bull. soc. chim.; through J. pharm. chim., 15 (1917), 291.

Sodium Cacodylate.—*Better than Salvarsan.*—W. N. Fowler states that after several years of experience with sodium cacodylate he comes to the conclusion that it will do all that salvarsan and neo-salvarsan can do while being much safer to handle. He is convinced, however, that the current dosage is too small when administered intravenously and he never gives less than 10 grain doses and often even as high as 30 grains.—Clinical Medicine; through J. Am. Med. Assoc., 6 (1917), 142. (H. H. S.)

Venarsen.—F. A. Brayton used venarsen in a series of active syphilitics to determine its therapeutic value. The clinical study was made because many physicians consider this sodium cacodylate preparation as an efficient substitute for salvarsan, even referring to it as "Denver salvarsan." His study confirms the experience of others, namely, that Venarsen is worthless in the therapy of syphilis. He also reports that a venous sclerosis was produced in each case in which the drug was administered and that it is capable of producing a severe nephritis.—J. Ind. State Med. Assoc., Sept. 15, 1917, 339. (W. A. P.)

Citric Acid and Malic Acid.—*Both Give the Iodoform Reaction.*—Since commercial malic acid generally gives the iodoform reaction, characteristic for citric acid, T. C. N., Brocksmit examined a great number of samples of malic acid for the presence of citric acid, but in no case could the latter be detected; therefore apparently both acids give the iodoform reaction. The separation of the two acids can easily be effected by means of their barium salts in acetic acid solution, barium citrate being insoluble, while barium malate is soluble.—Pharm. Weekblad, 54 (1917), 1371. (H. E.)

Citric Acid and Tartaric Acid.—*Separation.*—When citric acid is oxidized in acetic acid solution with potassium permanganate, acetone is formed which can easily be identified by converting it into iodoform with ammonia water and iodine. Malic acid also yields acetone on oxidation. In order to distinguish between the two acids the barium salts are prepared, only citric acid yielding a crystallizable salt. F. C. N. Broeksmit found that the detection of citric acid in tartaric acid is not possible by applying the oxidation directly to the mixture; the tartaric acid must first be removed, which can be done by converting it in the usual way into acid potassium tartrate. In order to detect tartaric acid in syrup of lemon the author gives the following method: Forty mls of the syrup are shaken out with four portions of each 10 mls of ether. Two layers are formed and the upper ethereal liquid is separated, filtered and evaporated until all the alcohol is expelled. The yellow colored residue is mixed with 6 mls of water, the mixture filtered and the clear filtrate divided into two equal parts. One part is neutralized with potassium carbonate and after the evolution of carbonic acid gas has ceased the other part is added, followed by a few drops of acetic acid and 3 mls of alcohol. The

acid potassium tartrate is separated by filtration and estimated in the usual way. It is claimed that by this method an admixture of 5 per cent. of tartaric acid to syrup of lemon can be detected.—Pharm. Weekblad, 52 (1917), 686. (H. E.)

Citric Acid and Citrates.—*Pharmacology of.*—Citric acid and the alkali citrates, potassium citrate and sodium citrate, are oxidized in the body with formation of carbonates and hence tend to increase the alkalinity of the blood. Citric acid and the alkali citrates tend to render the urine less acid and, in large doses, render it alkaline.—J. Am. Med. Assoc., 68 (1917), 1206. (W. A. P.)

Citric Acid.—*Manufacture in Messina.*—A new company, with a capital of 1,700,000 lire, has been found in Messina to manufacture citric acid.—Chem. and Drug., 89 (1917), 193. (K. S. B.)

Sodium Citrate.—*Pharmacology of.*—Salant and Wise find that when sodium citrate is ingested in large amounts by rabbits, it renders the urine alkaline. Only traces of citrate are found in the blood or urine. No toxic effects were observed unless the dose had been very large. When introduced by intravenous injection, it disappears rapidly from the circulation of rabbits, cats and dogs. When thus injected it gives rise to acute toxic symptoms. The fatal dose ranges from 0.4 to 1.6 Gm. per kilo body weight. The urine in these cases remains free from citrate until the dose administered by injection exceeds 0.5 Gm. per kilo. Hypodermic injection of the sodium salt may also occasion acute toxic symptoms.—J. Biol. Chem.; through Pharm. J., 98 (1917), 275.

Cresotinic Acids.—*Iodization of Ortho- and Para.*—J. A. W. Luck, after discussing the theory of the composition of these compounds, describes the experimental work in iodizing them. He made the iodized compound of *o*-cresotinic acid, its ethyl ester, its nitro derivative, replaced the I with OH, forming 2,5-dioxy-1-methyl-3-carboxylbenzene and 2-oxy-1,3-dicarboxylbenzene. *Para*-cresotinic acid was also iodized and from it similar products made as from the *ortho* acid.—J. Am. Pharm. Assoc., 6 (1917) 502. (H. H. S.)

Ferrocyanides.—*The Prussian Blue Hydrosol.*—Bachmann reports that the green solutions obtained when potassium ferrocyanide is added in large excess to ferric chloride or when colloidal ferric hydroxide in dilute solution is added to a blue solution of ferric ferrocyanide, do not contain a definite green compound and that alcohol, hydrochloric acid or the addition of salts precipitates the ordinary Prussian blue. The fineness of the colored particles, the hydrosol, increases, as ultra microscopic studies show, with increasing proportion of potassium ferrocyanide and the change to blue, if one of the above-mentioned substances is added, shows again an increase in size of the particles. Since analysis of the precipitate from a green solution shows the presence of ferric hydroxide it is concluded that the green color is a mixed color, resulting from presence of yellow colloidal ferric hydroxide in addition to Prussian blue.—*Z. anorg. Chem.*, 100 (1917), 77; through *J. Chem. Soc. Abs.* (A. V.)

Formic Acid.—*Rôle in Photosynthesis.*—H. A. Spoehr in a critical discussion points out some of the failings of the formaldehyde hypothesis of photosynthesis, from chemical and physiological aspects. Experiments are described by which it is shown that carbon dioxide and water are easily reduced to formic acid by means of light; that from formic acid a sugar-like syrup, analogous to formose, is formed under conditions such as exist in the green leaf, that this substance can serve as the only source of carbon for the development of the plant; and that plants thrive in an atmosphere of formic acid in the light.—*Plant World*; through *Pharm. J.*, 98 (1917), 251.

Calcium Glycerophosphate.—*Solubility of.*—J. F. Couch arrives at the following conclusions:

(1) The solubility in water of calcium glycerophosphate is increased by acids and by sodium citrate.

(2) The solubility in water is repressed by alcohol, glycerin, and sodium glycerophosphate solution.

(3) Lactic, citric, and phosphoric acids increase the solubility in presence of alcohol or glycerin or both.

(4) Acids hasten the hydrolysis of the salt-producing precipitates except that lactic acid tends to keep the hydrolytic products in solution.

(5) Alcohol and glycerin repress the hydrolysis even in the presence of acids.

(6) In the N. F. formula for the compound elixir the lactic acid should be increased to at least 40 mls, and in the formula for the elixir of calcium and sodium glycerophosphate the phosphoric acid should be replaced by at least 20 mls of lactic acid.—Am. J. Pharm., 89 (1917), 243. (R. P. F.)

H-Acid.—This is the short commercial name of 1,8-amidonaphthol-3,6-disulphonic acid, one of the most important intermediates in the dye industry. Six successive main steps are required to transform crude coal tar at 9 cents per pound to H-acid at \$2.50 per pound, as follows: Naphthalene, $C_{10}H_8$; sodium- β -naphthalene-sulphonate, $C_{10}H_7SO_3Na$; naphthalene-2,7-disulphonic acid, $C_{10}H_6(SO_3H)_2$; by nitration 1,8-dinitronaphthalene-3,6-disulphonic acid, $C_{10}H_4(NO_2)_2(SO_3H)_2$; by reduction 1,8-diamidonaphthalene-3,6-disulphonic acid, $C_{10}H_4(NH_2)_2(SO_3H)_2$; and by hydrolysis the final product, $C_{10}H_4.OH.NH_2.(SO_3H)_2$.

The numerals in the above formulas serve to indicate the relative positions in the naphthalene molecule or double benzol ring of the substituting groups and thereby distinguish between the various isomers.—Sc. Am., July 21, 1917, 51. (O. R.)

Hydrocyanic Acid.—*Effect of Anesthetics on Its Formation in Plants.*—J. J. Willaman finds that after exposure to the vapors of chloroform, ether or alcohol, the leaves of *Sorghum vulgare* yield more hydrocyanic acid, both of glucosidal and non-glucosidal origin, than normal leaves. The anesthetics stimulate the hydrolytic and synthetic activity of the enzyme. Enzyme powder prepared from leaves which had been exposed to chloroform vapor was about 25 times as active towards amygdalin as that obtained from untreated leaves. Freezing, by causing rupture of the cell walls and disturbing enzyme equilibrium, also increases the formation of hydrocyanic acid.—J. Biol. Chem.; through Pharm. J., 98 (1917), 405.

Hydrocyanic Acid.—*Detection and Estimation of Small Amounts of.*—I. M. Kolthoff examined the various methods recommended for estimating hydrocyanic acid and found the sensitiveness of these processes as follows:

Prussian blue reaction.....	2 Mgs. (CN) ¹ in one liter
Sulphocyanide reaction.....	0.1 Mg. (CN) ¹ in one liter
Picric acid reaction.....	1 Mg. (CN) ¹ in one liter
Guaiac reaction.....	0.004 Mg. (CN) ¹ in one liter
Phenolphthalein reaction.....	0.1 to 0.05 in one liter
Silver cyanide reaction.....	1 to 0.03 in one liter
Starch iodide reaction.....	0.1 in one liter

He states that the Prussian blue reaction is the most specific and should always be applied. The method depending on the conversion of hydrocyanic acid into sulphocyanic acid is apt to give unreliable results because some parts of the organism contain sulphocyanides. These should first be separated from the hydrocyanic acid by distillation from borax solution. The picric acid reaction is not typical and is given by quite a number of reducing substances, such as sulphurous acid, aldehydes, sulphuretted hydrogen, acetone, etc. The guaiac reaction also is not characteristic because oxidizing substances such as chlorine, bromine, iodine and indifferent substances, such as ammonia, gas, cigar smoke, etc., interfere with it. In the phenolphthalein reaction any sulphuretted hydrogen should first be eliminated by a solution of a cadmium salt. While small quantities of chlorine, bromine, hydrogen peroxide, etc., do not interfere with the reaction, large quantities are liable to produce negative and erroneous results. The silver cyanide reaction is not characteristic in the presence of halogens. Finally the starch iodide reaction is liable to give inaccurate results because several reducing substances are liable to bind iodine. —Pharm. Weekblad, 54 (1917), 1157. (H. E.)

Mercuric Oxycyanide.—*Volumetric Assay of.*—A. Tagliavini assays mercuric oxycyanide by dissolving 0.30 to 0.40 gramme in 50 mls of water, adding 1 gramme of pure sodium chloride and one drop of methyl orange solution (0.20 per cent.) and then titrating with tenth-normal hydrochloric acid. When the end-point is reached, 2 grammes of potassium iodide are added, when the liquid assumes its original yellow color, whereupon the solution is again titrated with tenth-normal hydrochloric acid. The number of mls of hydrochloric acid used in the first titration multiplied by 0.023434 gives the $\text{HgOHg}(\text{CN})_2$ content, while the number of mls used in the second titration multiplied by 0.012619 gives the content of $\text{Hg}(\text{CN})_2$.

By this method it was found that a commercial sample of oxycyanide contained 39.87 per cent. of $\text{HgOHg}(\text{CN})_2$ and 59.87 per

cent. of $\text{Hg}(\text{CN})_2$. The paper also discusses the medical uses of the oxycyanide.—Boll. chim. farm., 56 (1917), 297; through Chem. Abstracts (1918).

Cyanides.—*Molecular Rearrangement by Hydrogen Dioxide Solution.*—J. v. Dubsy describes a peculiar action of hydrogen dioxide on cyanides and especially potassium ferricyanide. When a solution of this salt is treated at 40° with the dioxide the yellow color of the solution changes to brownish yellow. On evaporating the liquid, beautiful crystals of the same empirical formula as potassium ferricyanide $\text{K}_3\text{Fe}(\text{CN})_6$ separate which dissolve in water with a deep red color, the color being almost black in a concentrated solution. The red ferricyanide and the green salt must be considered according to Wells as cyanide $\text{K}_3\text{Fe}(\text{C} \equiv \text{N})_6$ and isocyanide $\text{K}_3\text{Fe}(\text{N} \equiv \text{C})_6$. Dubsy believes that by the action of the dioxide an intermediate product $\text{K}_3\text{Fe} \begin{matrix} \swarrow (\text{C} \equiv \text{N})_3 \\ \searrow (\text{N} \equiv \text{C})_3 \end{matrix}$ is formed.

—J. prakt. Chem.; through Pharm. Weekblad, 54 (1917), 162. (H. E.)

Hydroxy-orthotoluic Acid.—Asahina and Furukawa have compared the natural 3-hydroxy-orthotoluic acid from hydrangenol (see Year Book, 1916, 396) with the synthetic product and confirm the identity of the two.—J. Pharm. Soc. Japan, 1917, No. 427, 967; through Chem. Abstracts (1918).

Lactic Acid.—*Substitution of Citric Acid for.*—Much of the so-called lactic acid on the market in Spain is really a weak solution of citric acid.—Chem. and Drug., 89 (1917), 877. (K. S. B.)

Potassium Oxalate.—*Poisoning by.*—Schirm and Wester being confronted by a case of "salt of sorrel" poisoning examined eleven commercial samples purporting to be potassium oxalate or "salt of sorrel" and found only one had that composition. This one was labelled "Bioxalas kalicus puriss. cryst." The others were found to consist of the tetroxalate, $\text{KHC}_2\text{O}_4 \cdot \text{H}_2\text{C}_2\text{O}_4 \cdot 2\text{H}_2\text{O}$. Hence practically all of the "bioxalate" that is sold is mostly tetroxalate. The lethal dose is variously stated in the literature, usually as 15 to 30 grammes; but fatal cases have been known with as little as 2 grammes. The bioxalate is less poisonous than the acid or the

tetroxalate, which are approximately equivalent; but no distinction is ever made in the literature. Experiments with guinea pigs showed that the greatest effect of the acid is its local action, while the salts are most poisonous after absorption into the body. This may explain why addition of soda to neutralize the acidity of rhu-barb and similar foods makes them more dangerous.—Pharm. Weekblad, 54 (1917), 1346.

Phenylbromacetic Acid.—*Influence of the Solvent upon the Sign of the Product in Conversion to Phenylaminoacetic Acid.*—In the sixth of a series of papers on the Walden inversion, G. Senter and S. H. Tucker state that when *l*-phenylbromacetic acid, in liquid ammonia, is converted, a levo amino acid is produced, while in aqueous ammonia a dextro acid results. A strongly dextrorotatory imino-diphenyl-acetic acid precipitates with the second crop of crystals upon acidifying the ammoniacal solution with hydrochloric acid. This experimental evidence supports the theory already deduced from kinetic consideration that the action of water upon the bromo acids produces a mandelic acid of the same optical sign as the bromo acid from which it is derived.—Chem. and Drug., 89 (1917), 469. (K. S. B.)

Picric Acid.—*As a Reagent.*—Folin and Doisy call attention to the impurities found in picric acid, which render the latter unfit for employment in the determination of creatine and creatinine by the colorimetric method. This is especially true of samples of the acid which were moist when obtained. The color obtained upon neutralizing picric acid of this kind with sodium hydroxide was in most cases so intense that the reagent was valueless. The authors state that the color obtained upon mixing 20 mils of saturated picric solution with 1 mil of a 10 per cent. solution of sodium hydroxide must not be more than twice as intense as is the color of the saturated solution of the acid.—J. Biol. Chem.; through C. U. C. P. Al. J., 24 (1917), 62. (G. C. D.)

Saccharin.—*In Syrups.*—E. Repetto recommends the use of saccharin in pharmaceuticals, in place of sugar. It is claimed that it has no bad effect upon the human body, and when taken in large doses is beneficial because it prevents stomach and intestinal fermentation. Glycerol is recommended as a solvent. The usual

colorimetric methods with resorcinol and ferric chloride, etc., for assay of saccharin in syrups and jellies are reviewed together with other methods, as the sweet taste found in the ether-petroleum ether extract, the presence in saccharin of sulphur compounds, and the conversion of saccharin into salicylic acid upon fusion with potassium hydroxide. These methods gave good results.—*Rev. pharmaceutica*; through *Chem. Abstracts*, 11 (1917), 3091.

Saccharin.—*Use in France.*—At a meeting of the Société de Thérapeutique, an interesting discussion on the use of saccharin was conducted. The conclusion arrived at was that in the present shortage of sugar the employment of a mixture of 1 part of saccharin with 1,000 parts of glucose should be permitted as a sugar substitute. Its use, however, in any other form in chocolates, jams, and other dietetic articles should be absolutely proscribed. Nor should it be allowed to be used in any product destined for infants, invalids and convalescents. Its presence should be indicated whenever it is employed.—*J. pharm. chim.*, 16 (1917), 61.

Dulcin.—*Use in Germany.*—P. Seidler reports that the laws prohibiting the use in Germany of artificial sweetening substances for food have been repealed. This has directed attention to parphenetolcarbamide, which, under the names of "sucrol" and "dulcin," is being used as a sugar substitute. It is claimed that this substance has been proved to be absolutely harmless to man and animals, and to possess the advantage over saccharin that it has no bitter after-taste, and does not mask natural flavors. It is stated to have 200 times the sweetening power of sugar.—*Chem. Ztg.*; through *Pharm. J.*, 98 (1917), 469.

Salicylic Acid.—*Use as Fly Poison.*—The Hygienic Laboratory of the United States Public Health Service has found in salicylic acid in 1 per cent. solution a highly satisfactory fly poison. It has the great advantage over many other fly poisons that there is little danger of toxic effects from accidental consumption of considerable doses of the solution.—*Drug. Circ.*, 61 (1917), 202.

Salicylates.—*Albuminuria from.*—In the seventh of a series of papers on the pharmacology of salicylates, P. J. Hanzlik and his co-workers find that the administration of salicylate in full thera-

peutic doses invariably causes the appearance of albumin, white blood corpuscles and cast-like bodies in the urine of the person taking it; that the albuminuria is due to the drug, not to a febrile condition; and that the administration of bicarbonate along with the salicylate has no demonstrable influence on the albuminuria.—Arch. Inst. Med., 19 (1917), 1029.

Salicylates.—*Excretion in the Urine of Rheumatic Patients.*—Hanzlik, Scott and Thoburn find that the total excretion of salicyl in the urine is about 15 per cent. lower in the case of rheumatic patients than with normal individuals under like conditions. The difference is greatest during the first ten to twenty hours of administration. The concentration of salicyl in the blood of rheumatic cases at toxicity is less than that in the urine at the time, and also less than in normal persons. The observed differences are not due to diuresis or to retention. They are attributed to an increased destruction of the salicyl in the febrile organism. The administration of sodium bicarbonate simultaneously with the salicylate has no effect on the excretion of salicyl or on its toxic effects.—J. Pharmacol.; through Pharm. J., 98 (1917), 353.

Methyl Salicylate.—*Detection of Phenolic Impurities in.*—A. R. Albright treats a sample of the suspected oil with benzoyl chloride, thereby converting methyl salicylate and phenol impurities into their crystalline benzoates. These, after recrystallization, are transferred to an object slide and are mounted in a fluid having the same refractive index as benzoyl methyl salicylate, the liquid used being an aqueous solution of potassio-mercuric iodide, which according to concentration may have a refractive index from that of water to n_D 1.71. The proper index for the solution used is, however, 1.658 and when such a solution is used as the mounting fluid and the slide is examined by means of a petrographic microscope, only the crystals of the benzoates of phenolic impurities will be visible.—J. Am. Chem. Soc., 39 (1917), 820.

Mercuric Salicylate.—*Method of Dispensing.*—The following formulæ and method of dispensing this now popular substance are furnished by J. Leon Lascoff in a paper read before the Section of Practical Pharmacy and Dispensing at the Atlantic City meeting. All suspensions must be made under strictly aseptic conditions.

1. Mercuric salicylate.....	1.0 Gm.
Mucilage of acacia.....	0.5 mil
Distilled water.....	20.0 mils

The mercuric salicylate is triturated with the mucilage, and the water is added.

2. Mercuric salicylate.....	10.0 Gm.
Olive oil to make.....	30.0 mils
For Injection.	

As this preparation is for hypodermic use, sterilization is absolutely necessary.

3. Quinine and urea hydrochloride.....	2.0 Gm.
Distilled water.....	2.0 mils
Wool fat.....	12.0 Gm.
Mercuric salicylate.....	10.0 Gm.
Liquid petrolatum to make.....	100.0 mils

The quinine and urea hydrochloride are dissolved in the distilled water. The mercuric salicylate is triturated with the anhydrous wool fat. Add the former solution to the triturate and then add gradually the liquid petrolatum.

4. Pills (McDonald)	
Mercuric salicylate.....	0.6 Gm.
Extract of gentian.....	2.0 Gm.
Make into a pill mass and divide into 30 pills.	

In preparing this pill mass, care should be taken to have the mercuric salicylate uniformly subdivided, the mass soft, and the resulting pill as small as possible.

5. Tablets	
Mercuric salicylate.....	1.0 Gm.
Sugar of milk—sufficient	
Make into 50 tablets	

The mercuric salicylate should be thoroughly triturated with the sugar of milk. Avoid the use of metallic utensils.

6. Ointment	
Mercuric salicylate.....	3.0 Gm.
Petrolatum and wool fat, each to make..	30.0 Gm.

This ointment should be made in a glass mortar. Triturate the mercuric salicylate thoroughly before adding the base.

7. Ampuls	
Mercuric salicylate.....	10 per cent.
Quinine and urea hydrochloride.....	0.5 per cent.
Liquid petrolatum.....	1.0 mil

In preparing ampuls, the ordinary suspension is by no means advisable. However, when the suspension is made with the addi-

tion of wool fat and a few drops of water (as in Formula 3), a uniform and equal subdivision of doses is found.—J. Am. Pharm. Assoc., 6 (1917), 143. (L. S.)

Sodium Salicylate.—*Hypodermic Administration in Rheumatism.*—Adnot recommends that a sterilized solution of 8.75 grammes of sodium salicylate and 1.25 grammes of caffeine in 50 mils of distilled water be administered by this method in proper dosage. The advantages claimed are rapid action and apparent absence of by-effects.—J. med. et chim.; through Drug. Circ., 61 (1917), 176.

Sodium Salicylate.—*Incompatible Mixtures with Ferric Chloride.*—Prescriptions consisting of sodium salicylate, sodium bicarbonate, tincture of ferric chloride and water are difficult to compound on account of the numerous incompatibilities present. William Duncan states that the following manipulation produces excellent results. Dissolve the salicylate in a portion of the water, add the iron, mix, add the bicarbonate and finally the remainder of the water when the reaction is complete. Because of the effervescence large vessels should be employed. The iron salicylate compound appears to be ferryl-salicylic acid with the iron linked through the phenolic group of the acid and capable of producing, with alkalies, combinations analogous to the iron scale salts.—Pharm. J., 98 (1917), 236. (C. W. B.)

Sodium Salicylate.—*Posology of.*—V. L. Yanovsky believes that the proper dose of sodium salicylate in all cases of articular rheumatism and in severe muscular and tendon rheumatism is from 2.5 to 5 grammes in the twenty-four hours. If this does not bring improvement in three days the treatment should be changed to salicylic acid treatment, giving 0.6 gramme four times a day. With salicylates, as with all drugs, it is important to give the exactly proper dose, as any excess is liable to have a toxic action and counteract the therapeutic influence, while with too small a dose the organism is deprived of the aid it is possible to bestow, but the drug in small amounts may have some unanticipated action. As to the salicylates, the fear of injurious action on the heart is a traditional survival of the unfortunate experiences when they were first introduced, and were given in enormous doses for all kinds of disorders. For local application, Bourget's salve is recommended as effectual and non-irritating, although it contains 25 per cent. of

salicylic acid. The formula is: Salicylic acid, 12.5 parts; turpentine, 8 parts; lard, 42 parts.—Russky Vrach; through J. Am. Med. Assoc., 68 (1917), 587.

Sodium Sulphocarbonate.—*Use as Disinfectant.*—Maxwell Le-froy recommends the use of a 1 per cent. solution of sodium sulpho-carbonate as a disinfectant for manure piles. Upon coming into contact with weak acids, which are found in the soil or manure, it splits into CS_2 and H_2S , which are poisonous to flies, maggots, etc. The value of the manure is not diminished.—Chem. and Drug., 89 (1917), 511. (K. S. B.)

Bromural.—*Assay of.*—This substance, urea alpha-monobrom-isovalerate, can be tested for bromine by warming 0.10 gramme with 2 mls of concentrated nitric acid and 5 drops of a 10 per cent. solution of silver nitrate, when there is obtained a yellow precipitate soluble in ammonia.

In assaying for bromine, 1 gramme is fused with potassium nitrate and sodium carbonate, the fused mass, after cooling, is dissolved in water, acidulated with nitric acid and is then treated with 10 per cent. silver nitrate solution. The silver bromide, thus obtained, after washing and drying, should not weigh more than 0.84 gramme.

In determining the bromural content of tablets, these are powdered and are extracted with warm alcohol; the alcoholic extract on evaporation leaving the bromural, which is then weighed.—Pharmazev. J.; through J. pharm. chim., 15 (1917), 24.

ALKALOIDS.

Alkaloids.—*Economic Use of Costly.*—N. Harriman states that for the solutions of expensive alkaloids a preservative must be used or else the solutions become moldy and deteriorate in strength. These disadvantages are said to be entirely overcome by using the following solvent in place of distilled water:

Tincture of iodine.....	1 drop
Methyl salicylate.....	8 drops
Distilled water.....	2 pints

This should be well shaken and kept in a well-stoppered bottle. It is said to keep sterile indefinitely even when opened often. It is slightly irritant, but only at the instant of instillation. Atro-

pine, cocaine, novocaine and such solutions are said to keep indefinitely when prepared in this way.—Brit. Med. J.; through Am. Drug., 65 (1917), 111.

Alkaloids.—*Extraction from Aqueous Solutions.*—L. Launoy made 200 mls of water containing the alkaloid alkaline with 0.5 gramme of dry sodium carbonate and then extracted by shaking with 10 mls and then 5 mls of pure chloroform. The residue obtained on evaporating the chloroform was dissolved in 1 mil of tenth-normal sulphuric acid and the resulting solution was distributed equally among three test-tubes containing a drop of Bouchardat's, Tanret's and Sonnenschein's reagent, respectively. Assuming complete extraction the average sensitiveness was about one in two million. The most sensitive was aconitine (1 in 4 million). The alkaloids thus examined were aconitine, atropine, brucine, cocaine, colchicine, eserine, pilocarpine, strychnine, veratrine and conicine.—Compt. rend., 165 (1917), 360; through Chem. Abstracts (1918).

Alkaloids.—*Extraction Influenced by Adsorption.*—Palme and Winborg were led after experiments on cinchona to the conclusion that the adsorption of the bark is an important factor. Five gramme samples were extracted with 100 mls of 2 per cent. hydrochloric acid for a day and then the fluid was decanted and assayed. The extraction was repeated in the same manner for 5 days. The amounts of alkaloid brought into solution by the successive extractions, plotted on a co-ordinate plan gave a curve satisfying the adsorption equations of Freundlich and of Arrhenius. In view of the fact that the alkaloids contained in the bark are a mixture of different substances with different properties (including solubility) the harmony between observed and calculated figures is noteworthy.—Svensk Farm. Tidskrift; through Chem. Abstracts, 11 (1917), 2528.

Alkaloids.—*Growth of Yeast and Molds on.*—Ehrlich reports that the following nitrogenous substances, pyridine, piperidine tartrate, coniine, nicotine, cinchonic acid, quinine, brucine, cocaine, and morphine, could be utilized as sources of nitrogen by *Aspergillus niger*, *Penicillium glaucum*, *Pichia furinose*, *Oidium lactis* and *Willia anomala*.—Biochem. Z., 79 (1917) 152; through J. Chem. Soc. Abs. (A. V.)

Alkaloids.—*Microchemical Tests.*—O. Tunmann has studied the action of iodized zinc chloride solution on more or less impure alkaloidal residues, such as are prepared by the Stas-Otto method. This reagent does not yield crystalline products with arecoline, brucine, cocaine, quinine, cinchonine, coniine, colchicine, narceine, nicotine, eserine, or veratrine. On the other hand, it is well adapted for the identification of strychnine, sparteine, the opium alkaloids, morphine, papaverine, cryptopine and codeine, as well as atropine and hyoscyamine. With atropine, brown or dark red to blackish red crystals, mostly rhombs, are immediately produced, which, at the commencement of the reaction, vary greatly in size. All the crystals shine but little between crossed Nicols, and do not exhibit pleochroism. The crystal crosses, consisting of 4 rhombs, are particularly characteristic. The iodide crystals of hyoscyamine shine feebly in polarized light; they are very small ($4-8\ \mu$), almost black, and without pleochroism. The platelets have generally a far less regular circumference than the atropine crystals. Iodized zinc chloride yields crystals even with very impure morphine preparations; initially, fine pale brown needles are formed, which after 10–20 minutes unite to sheaves, and are then transformed into prismatic crystals with direct extinction. The latter are brown, the larger ones being nearly black; they do not exhibit pleochroism and scarcely shine between crossed Nicols. Papaverine and cryptopine give long, dull red, yellowish red or greenish red crystals from $2-3\ \mu$ diameter which have direct extinction, show red to blue polarization colors, and exhibit pleochroism. The latter phenomenon yields an excellent method of differentiation between the 3 opium alkaloids considered here. In addition to the crystals described above, deep red drops are also formed which, after some hours, pass into deep red aggregates; this points to the presence of a second alkaloid (cryptopine?) in papaverine. Codeine behaves very differently. A powdery precipitate is first obtained, which deposits larger and smaller particles when warmed, from which very slender, generally curved, pale brown crystals grow. Excess of the reagent is to be avoided. Sparteine is preferably converted into the sulphate, and this gives with the reagent fine yellowish red crystal threads, which form sheaves and brushes at their ends. When warmed, coarser prismatic crystals appear after about 30 minutes, and in addition, when heated, yellow aggregates are occasionally obtained. All the crystals shine strongly in polarized light, have extinction parallel to the long axis, and show pleochroism. When warmed with iodized zinc chloride, strychnine gives

brownish red or blackish red spheres or aggregates which attain a diameter of $50\ \mu$ and lie separately or grouped in chains. They glow red between crossed Nicols, but exhibit no pleochroism. Unless specific mention to the contrary is made, the above data refer to crystals produced after 1 to 2 hours' action.—Apoth. Ztg.; through Chem. Abstracts, 11 (1917), 3092.

Alkaloids.—*Preservation in Drug Capsules.*—T. Paul found by comparative tests at 37° , 70° , and 100°C. , with aqueous morphine hydrochloride solutions in containers of ordinary glass, Jena glass, and quartz, that decomposition occurs slowly even in quartz vessels. Hence it cannot be attributed solely to impurities derived from glass, although these accelerate the decomposition. Solutions of salts of physostigmine, atropine, scopolamine, homatropine, hydrastine, and adrenaline, also organotherapeutic preparations, decompose even more readily. It is very difficult to sterilize the aqueous solutions of these without incurring decomposition. Such additions as small amounts of hydrochloric acid, glycerin, alcohol, dextrose, and other substances which have been proposed, are found to be inefficient, and in some cases even to accelerate decomposition, without this becoming apparent. The author proposes to dissolve the active ingredient in a volatile solvent. This solution is introduced into a sterile capsule, drawn out at the ends. The solvent is then volatilized by a current of sterile air at 20° to 50°C. , and the ends of the capsule are sealed. The amounts of the non-volatile solvent, sodium chloride solution, or distilled water, requisite to make the prescribed injection is then introduced into a pipette-shaped container, which is sealed and sterilized. In this the dry material in the capsule is dissolved immediately before use.—Münch. Med. Wochschr.; through Pharm. J., 98 (1917), 48.

Alkaloids.—*New Reagent for.*—A new alkaloidal reagent is described as obtained by dissolving 2 grammes of *p*-dimethylamido-benzaldehyde in 6 grammes of concentrated sulphuric acid and adding to the solution 0.4 gramme of water. The dark yellow-colored solution keeps for two weeks. When mydriatic alkaloids are gently warmed with the reagent an intense purple color is produced. The reagent produces with morphine or codeine a red, with quinine a red-brown, with physostigmine and veratrine a

green, and with narcotine and papaverine an orange color.—Pharmazev. J.; through Drug. Circ., 61 (1917), 189.

Alkaloids.—*Color Reaction for.*—G. Denigès finds that when titanium dioxide, dissolved in concentrated acids, is brought into contact with solutions of alkaloids containing phenol hydroxy groups, such as morphine, etc., color reactions are noted, the alkaloids behaving in this respect as do phenols in general. When two mls of the reagent are allowed to react with the alkaloid itself, or with a solution, the following color changes are noted: blood-red with morphine, reddish violet with apomorphine, wine-red (intermediate between the first two) with oxydimorphine, orange, like an alkali dichromate solution with cupreine; deep orange with tyrosine and hordenine; reddish brown with adrenaline (very sensitive). No reaction is obtained with either methylcupreine (quinine), or methyl-morphine (codeine), in the cold; heating with the reagent will, however, cause a color reaction to take place. Tyrosine contained in proteins requires an application of gentle heat, before the characteristic orange color appears. In preparing the reagent from rutile (native titanium dioxide), this is boiled with concentrated sulphuric acid for several hours. A very small quantity of rutile only is dissolved. The solution is allowed to cool, and the clear liquid separated from the undissolved material. Ann. chim. anal.; through C. U. C. P. Al. J., 24 (1917), 45. (G. C. D.)

Alkaloids.—*Solubility.*—Due to amorphous forms of alkaloidal salts being frequently contaminated with varying amounts of the acid salt, the solubilities given publication are often wrong, says D. B. Dott. Acid morphine sulphate dissolves in 1 part of water, but upon standing deposits the crystalline form until the solution is about 1 in 24, which is about the solubility of neutral morphine sulphate. Solutions of pure white emetine hydrochloride in 9 parts of water later require 3 parts more of water to remove the turbidity caused by crystalline precipitation. Morphine has been shown to be taken up to a slight extent by ether and later deposited as crystals. Hence only crystalline forms of alkaloidal salts should be used in determining solubilities.—Chem. and Drug., 89 (1917), 1060. (K. S. B.)

Adrenaline, Nicotine and Lobeline.—*Physiological Assay of.*—W. Storm van Leeuwen has found that the blood-pressure method applied to cats or dogs is very accurate in the valuation of products containing adrenaline, but that when only very small amounts of the bases are present, Trendelenburg's frog method should be applied. This method is carried out by perfusing Ringer's solution through the dorsal part of the frog and then adding the weak adrenaline solution to the perfusing liquid by which contraction of the vessels is produced which itself retards the rate of circulation of the solution. This method is quite complicated, as is the method of Cannon and La Pace. For practical purposes the properties of adrenaline to contract the pupil may be utilized. The blood-pressure method is also very convenient for the estimation of nicotine but it must be taken into consideration that in certain species of animals first a fall of pressure and then a rise is produced and that in some other species the fall is even greater than the rise. This can be partly counteracted by injecting into the animals atropine solution before administering the nicotine. Attempts to estimate lobeline by the blood-pressure method using nicotine as a standard were quite successful but the author found that the nicotine should always be injected before the lobeline, because when injected after the lobeline a much greater rise is produced than when injected first. Therefore the initial standard obtained with nicotine cannot be controlled by a subsequent injection of this alkaloid after the application of the lobeline. Lobeline seems to act synergistically on the nicotine, increasing the toxic action of the latter considerably. The author further points out that the commercial samples of tincture of lobelia vary considerably in toxicity, two being 300 and 500 times, respectively, more toxic than the others.—Pharm. Weekblad, 54 (1917), 1329. (H. E.)

Adrenaline.—*Biological and Chemical Standardization of Solutions.*—Comment is made by J. Stanley White that in the last British Pharmacopœia there is no recognition of physiological standardization for preparations of this type. Adrenalin solution is prone to oxidation and this process is not retarded by the addition of chloroform. The pink and red colors sometimes present indicate various degrees of oxidation and do not entirely unfit such solutions for use although allowance must be made for the loss of a certain amount of activity. Solutions showing a brown precipitate should be rejected. Note is made of solutions containing

traces of sulphurous acid which, while it does not prevent oxidation, effectually masks the change in color due to oxidation changes. The most satisfactory method of standardization is that suggested by Houghton. Although physiological standardization is the most accurate, it is not possible except in a pharmacological laboratory, and the author suggests the following chemical method as a means of approximately determining the activity of adrenalin preparations.

Color Standard.

(a) Potassio-platinic chloride, 20 Gm., dissolved in a small quantity of water. Add 100 mls strong hydrochloric acid and follow with water to make up one liter.

(b) Crystalline cobaltic chloride, 12 Gm., dissolved in water, with hydrochloric acid 100 mls and made up with water to one liter.

Mix one part of (a) with three parts of (b) and adjust by dilution with water until the solution matches the following mixture in color.

5 mls of 1 : 50,000 pure adrenalin solution, dissolved in twice the calculated amount of hydrochloric acid, with 5 mls of 1 : 500 potassium iodate solution. Heat this mixture to just below boiling point and allow to stand for fifteen minutes. Adjust the above color standard solution to the color obtained by this treatment.

Test of Commercial Powdered Gland.

Place 0.01 Gm. in a test-tube with 5 mls of dilute hydrochloric acid and 5 mls of 1 : 500 potassium iodate and treat as above.—Pharm. J., 98 (1917), 159. (C. W. B.)

Adrenaline.—*Use in Asthma.*—It is stated that when a 1 to 1000 solution of adrenalin is used intravenously, it relieves almost instantly the paroxysms of asthma. The starting dose should be from 0.18 to 0.24 gramme of the 1 to 1000 solution mixed with normal saline. The effect lasts for twenty-four hours, when another dose should be administered, the dosage being gradually increased during the treatment, which should be continued during several weeks.—Med. Press; through J. pharm. chim., 15 (1917), 393.

Allantoin.—*Melting Point.*—H. E. Watt says that allantoin fuses, with decomposition, at 235° C.—Chem. and Drug., 89 (1917), 1060. (K. S. B.)

Apomorphine.—*Absorption through the Conjunctiva.*—Although cases have been published in which constitutional reaction and even alarming toxic symptoms have followed the use of cocaine or of atropine in the eye during the course of ophthalmic work, it is not generally recognized that such absorption occurs very readily. D. I. Macht has proved that this is so by causing emesis in dogs, even when under the influence of anesthetics, by the introduction of apomorphine hydrochloride into the conjunctival sac. These animals are almost as readily caused to vomit by morphine administered in the usual manner as by apomorphine. The same effect is produced when morphine is applied to the eye. Consequently, care is necessary when employing toxic alkaloids for ophthalmic purposes, especially in cases where idiosyncrasy may be suspected. It is probable that absorption occurs through the lymph and blood, and not through the nasal duct.—J. Am. Med. Assoc., 68 (1917), 1230.

Apomorphine and Pyramidon.—*Reactions of.*—According to Guglielmelli, arsenotungstic acid may be used as a reagent for the identification of pyramidon. In combination with this substance it gives a white precipitate soluble in alkalis forming a deep blue solution. Arsenotungstomolybdic acid under the same conditions yields an indigo-blue solution. These reagents, according to Palet, may also be utilized as a test for apomorphine which gives with them an indigo-blue coloration.—Ann..soc. quim. Argent.; through Drug. Circ., 61 (1917), 176. (C. W. B.)

Atropine.—*Assay of.*—H. B. Rasmussen has subjected the so-called silicotungstate method of determining atropine and isomers to a review. In his work he finds that a moderate excess of the precipitant, say about 10 per cent., does not materially affect the result. The precipitate obtained is allowed to stand for from 8 to 12 hours and then collected in a Gooch crucible. It is washed three times with dilute hydrochloric acid, 1.50 per cent. in strength, and then ignited. After all carbon is removed the ignition is continued for about 5 minutes over a Teclu burner. Owing to the slight volatility of tungstic oxide at high temperatures, it is not possible to ignite to constant weight. In calculating the weight of atropine from the weight of the residue obtained after ignition, the factor 0.4067 is employed. A correction for solubility must also be made, and this amounts to 0.0054 gramme for each 100

mils of liquid used. If it is thought necessary the results thus obtained may be compared with those found upon determining the nitrogen in the precipitate.—Ber. pharm. Ges ; through C. U. C. P. Al. J., 24 (1917), 130. (G. C. D.)

Atropine.—*Antagonism to Certain Emetics.*—C. Eggleston finds that atropine and hyoscyamine can antagonize vomiting produced by central emetics, such as pilocarpine and nicotine, but not that of other central emetics, such as morphine, apomorphine, aconitine, emetine and ouabain. This antagonism to pilocarpine and nicotine is of a physiological nature and suggests a complexity of the central vomiting mechanism, on the one hand stimulation by pilocarpine and nicotine and depression by atropine: on the other hand, stimulation by morphine, but not by pilocarpine or nicotine, and no depression by atropine.—J. Pharmacol.; through Pharm. J., 98 (1917), 209.

Atropine, Hyoscyamine and Scopolamine.—*New Reagent for.*—R. Wasicky reports that a trace of atropine, hyoscyamine or scopolamine warmed on a watch-glass with a drop of a solution of 2 Gms. of *p*-dimethylamido benzaldehyde in 6 Gms. of sulphuric acid and 0.4 Gm. of water gives an intense red coloration passing into violet. Novatropine, tropacocaine and cocaine give no reaction. Other alkaloids give colors, but not the same as the atropine group.—Z. anal. chem.; through Pharm. J., 99 (1917), 88.

Betaine Hydrochloride.—It contains 23.8 per cent. absolute hydrochloric acid and 8 grains corresponds to about 18 minims of diluted hydrochloric acid. In solution betaine hydrochloride dissociates into hydrochloric acid, but it is not so efficient in aiding the action of pepsin as an equivalent amount of hydrochloric acid.—J. Am. Med. Assoc., 68 (1917), 931. (W. A. P.)

Caffeine.—*Inhibition of Water through.*—Belák suggests that the action of caffeine consists apparently in causing an increase in the permeability by water, followed by a transient increase in the capacity for binding water and that the toxic action is due to the coagulation of the proteins leading to a release of water by the tissues.—Biochem. Z., 83 (1917), 165; through J. Chem. Soc. Abs. (A. V.)

Cocaine and Novocaine.—*Pharmacology of.*—In a bulletin of the Hygienic Laboratory, G. B. Roth reports his study of the action of these two anesthetics on laboratory animals. He finds (a) that novocaine is several times less toxic on animals than is cocaine, the method of administration and the individuality of the animal being, however, factors; (b) that novocaine possesses many of the properties of cocaine as shown by experiments on the isolated heart on the striped muscle and on the circulation and respiration of anesthetized animals; (c) that the depressing effect of novocaine on the blood pressure and respiration of animals suggests caution in its clinical use where the blood pressure is low or the heart is weak; (d) that novocaine should be injected subcutaneously with great caution, to prevent toxicity by entrance into the circulation; (e) that individual susceptibility is a factor in the administration of either cocaine or novocaine.—*Am. J. Pharm.*, 89 (1917), 288.

Cocaine.—*Derivatives of.*—According to D. R. P. 301,139, the compounds obtained from alkaloids of the cocaine group by demethylation at the nitrogen atom, *e. g.*, anhydronorecgonine (tropene-2-carboxylic acid) and anhydrodihydronorecgonine (tropene-2-carboxylic acid) and their esters, on alkylation at the nitrogen atoms by means of halogen-alkyl benzoates, yield compounds with marked physiological activity similar to cocaine. They are less poisonous than this, but possess great local anesthetic power and are sterilizable.—*Chem. Zentr. II.*, 1917, 714; through *J. Chem. Soc. Abs.* (A. V.)

Codeine Phosphate.—*Calomel in.*—Hackenbeck reports an examination of a sample of codeine phosphate which showed the presence of 2.96 per cent. of calomel. Wollschlaeger states that some years ago he had received codeine phosphate which also showed the presence of calomel.—*Pharm. Ztg.*; through *Drug. Circ.*, 61 (1917), 190.

Emetine.—*Diarrhea Produced by Use of.*—Emetine not rarely produced a bloody diarrhea in the course of its clinical use in the treatment of amebic dysentery. The symptoms and the gross appearance of the stools in emetine diarrhea are almost indistinguishable from those of amebic dysentery. Contrary to a prevalent opinion, children are not especially resistant to the effects of emetine and the dosage for them must be graduated with great care.—*J. Am. Med. Assoc.*, 69 (1917), 916. (W. A. P.)

Emetine.—*In Dysentery and Diarrhea.*—Emetine is accepted to-day as an almost ideal specific against amebic dysentery. Experience indicates that by its use abscess of the liver can be prevented and even cured. When a differential diagnosis between amebic and bacillary dysentery cannot be made, emetine may be of diagnostic value because improvement follows from its use if the case is amebic. In neglected cases and some other forms of the disease the emetine treatment may fail of complete success. As a direct cure for pyorrhea emetine seems to have failed, not because it does not act on the ameba which are found in the pyorrheal pockets, but because pyorrhea is not caused by ameba.—J. Am. Med. Assoc., 68 (1917), 374. (W. A. P.)

Emetine.—*Pharmacology of.*—Pellini and Wallace emphasize the following points regarding emetine, which are of some importance in view of the prevailing tendency to prescribe that drug somewhat freely for various amebic diseases. Emetine depresses, and may eventually paralyze, the heart. It is a powerful gastro-intestinal irritant, whether given by the mouth or by hypodermic injection. It causes a definite derangement of metabolism, characterized by an increase in nitrogen output and acidosis. While in moderate doses these actions may not be of importance in normal individuals, in pathogenic states of the circulation, intestinal tract, or metabolism they may be a very definite source of danger.—Am. J. Med. Sci.; through Drug. Circ., 61 (1917), 20.

Emetine Bismuth Iodide.—*In Treatment of Dysentery Carriers.*—Imrie and Roche find that although the administration by hypodermic injections of emetine hydrochloride solution is efficacious for the destruction of the mobile form *Entamœba histolytica*, that salt does not invariably destroy the organism in the encysted form. Since patients who harbor these encysted *entamœbæ* may prove a source of infection to others, it is very necessary that they should be freed from the parasites before being discharged. Dale has recommended the administration by the mouth of 3 grains of emetine bismuthous iodide for twelve successive nights. This should be given at 10 p.m., three hours after the patient has taken a light supper. If administered immediately after food, nausea and vomiting occur in some cases. The authors have confirmed the value of this treatment in six cases. In five of these, encysted *entamœbæ* ceased to be passed in the feces after 48 hours. The

sixth case gave positive microscopic results up to the sixth day, after which no entamœbæ cysts were found. Four of these six cases had been previously treated with hypodermic injections of emetine hydrochloride.—Lancet; through Pharm. J., 98 (1917), 48.

Waddell, Books, Watson and King find (1) that emetine bismuth iodide is much more effective than emetine hydrochloride in the treatment of carriers of *Entamœba histolytica*, but about 20 to 25 per cent. of failures may occur; (2) that the intensely irritating action of the drug in many cases is a drawback in its general application. Keratin coating serves to minimize or prevent its physiological action, but in the form of salol-coated pills the drug, without losing efficacy, is rendered much less irritating; (3) the drug is without appreciable effect upon the intestinal flagellates, but has an effect, usually temporary, on the *Entamœba coli*.—Lancet; through Pharm., J., 99 (1917), 125.

Emetine Hydrochloride.—*Toxic Dose.*—While Méry and Milliou find the toxic dose of emetine hydrochloride is 0.010 to 0.013 gramme per kilogramme of animal (species not stated.—Ed.), they also find 0.024 gramme per kilogramme of animal administered in smaller doses during 24 hours may prove fatal. They therefore warn uses against the cumulative action of the alkaloid.—J. pharm. chim., 16 (1917), 160.

Emetine Hydrochloride.—*Toxicity of.*—Johnson and Murphy treated some 140 cases of endometric dysentery with emetine hydrochloride, and report that the effects of this treatment should be very carefully watched and regulated. The dangers are somewhat analogous to those of salvarsan in the treatment of syphilis. Two of the patients died under the emetine treatment from peculiar conditions in no way connected with the disease for which they were being treated, while five others showed unusual symptoms, which, in the absence of any other known causes, were attributed to emetine. In the two fatal cases there was inability to swallow after food had reached the œsophagus, hepatization of the lungs, and rapid and uncontrolled action of the heart; there was also a tendency for the head to fall forward, and finally lobar pneumonia. In the five other cases the symptoms were similar, and disappeared when treatment was stopped.—Military Surgeon; through Pharm. J., 98 (1917), 139.

Emetine Hydrochloride.—*Toxicity of.*—The toxic dose of emetine hydrochloride for the rabbit is 0.002 Gm. per kilo body weight by intravenous injection and 0.03 Gm. subcutaneously. For the guinea pig it is 0.007 Gm. intravenously and 0.09 Gm. hypodermically. Maurel has reported much higher doses than the above, but when the author repeated Maurel's experiments his animals all died before reaching that investigator's figures for merely toxic doses. Applying the above figures to man, it is computed that toxic effects would be induced in a man of 60 kilos by a dose of 0.12 Gm. of emetine hydrochloride given intravenously, or by 1.8 Gm. administered hypodermically. The maximum safe dose would, therefore, be 0.06 Gm. intravenously or 1.2 Gm. by subcutaneous injection. Admitting the fallacy of quantitatively applying results obtained from animals to man, yet the above figures show a surprising harmony with the recorded figures for human emetine poisoning, a number of cases of which are recorded. R. Dalimier is strongly of opinion that a total dose of emetine hydrochloride by hypodermic injection, even if spread over several weeks, is the limit of safety. He is convinced that in certain cases of dysentery in which emetine has been given some of the symptoms ascribed to the disease are in fact the work of the remedy.—*Presse med.*; through *Pharm. J.*, 98 (1917), 319.

Emetoidine (Kryptonine).—H. S. Browne reports some results of a study of the pharmacology of emetoidine, a colloidal alkaloid discovered thirty years ago by J. U. Lloyd. At the suggestion of Dr. H. W. Wiley, Dr. Lloyd named it "Kryptonine," from the Greek meaning, "the hidden thing." Later Dr. Bernard Fantus suggested that "Emetoidine" would be appropriate because of its similarity to emetine. For the same reason Mr. Brown recommended the change and Dr. Lloyd has acquiesced.

Emetoidine is colloidal as are its compounds with acids. It is orange-yellow when finely divided, garnet-red when coarse, black in mass. It has a very bitter taste and is soluble in water, alcohol, chloroform, glycerin, dilute acids and dilute alkalies.

In a comparative study of it and emetine Dr. Browne found that it is less toxic for paramecia and for rabbits than emetine; injected intravenously it lowers blood pressure similarly; the central nervous system and respiration are depressed as with emetine; and its emetic action is local and not stimulation of the vomiting center.—*J. Am. Pharm. Assoc.*, 6 (1917), 1043. (Z. M. C.)

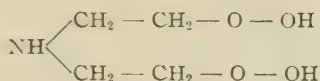
Epinephrine.—*Action of Ultraviolet Rays on.*—A. Savapol states that exposure to ultraviolet rays does not lessen the hemolytic and agglutinating properties of epinephrine hydrochloride solutions, as shown by experiments of 5 per cent. suspensions of sheep's erythrocytes in physiological salt solution. On the contrary the agglutinating action is intensified to a certain extent, being more rapid and complete with those solutions which have been irradiated. Corpuscle permeability is the same with normal and irradiated epinephrine solutions. The necrotizing property of the solutions is not affected by exposure for ten minutes to ultraviolet light. After $1\frac{1}{2}$ hours exposure, however, this property is entirely removed; no more than a local inflammatory reaction is produced at the seat of injection subcutaneously into guinea pigs. Similar injections with normal solutions not exposed to ultraviolet light cause local necrosis, with loss of tissue, and subsequently leave a scar resembling a burn.—*Compt. rend. Soc. Biol.; through Pharm. J.*, 98 (1917), 405.

Flammoids.—*Use.*—Flammoids are cones of a solid chemical [Hexamethylenamine?—Ed.] and are intended to replace methylated spirit in the household for heating purposes. They burn with a steady non-smoky flame.—*Chem. and Drug.*, 89 (1917), 896. (K. S. B.)

Hexamethylenamine.—*Chemical and Therapeutic Properties.*—Howell and Keyser give an excellent summary of previous work on this subject, furnishing a bibliography of 19 titles. They also report work of pharmacological character, finding the action of hexamethylenamine as a uric acid solvent is very slight; that it has no action on the heart; that the hypodermic injection of 36 grains of the chemical into a frog during $1\frac{1}{2}$ hours produced co-ordination of muscles but no anesthetic action; that its administration to man apparently increased the amount of ammonia in the urine; and that the compound is decomposed in the stomach and retards the action of ferments present therein.

The authors also studied the heat produced on ignition of $7\frac{1}{2}$ grain tablets of hexamethylenamine, finding that the flame produced heated 10 mls of concentrated sulphuric acid from 158.5° to 170.5° .—*J. Am. Pharm. Assoc.*, 6 (1917), 445.

Hexamethylenamine.—*A New Peroxide of.*—By dissolving 140 grammes of hexamethylenamine in enough solution of hydrogen dioxide, then adding 140 grammes of nitric acid. Pour the mixture into enough solution of hydrogen dioxide to make a total weight of 1500 grammes. The reaction begins immediately, with some elevation of temperature and after 3 or 4 hours, an abundant crop of crystals are obtained. The yield is about 43 per cent. of the hexamethylenamine taken. According to A. Leulier, the proportions of dioxide solution and of nitric acid do not seriously affect results. Phosphoric, sulphuric, citric and acetic acids prevent the reaction. Hydrochloric acid permits the reaction if the mixture is heated to 90°. Tartaric acid gives a precipitate of ammonium tartrate, but not of the peroxide. The peroxide has the formula



It occurs in white crystals insoluble in water, ether, and cold alcohol, but is soluble in warm alcohol. It is very explosive, detonating by hit of a hammer or on heating. It is different from the peroxides of hexamethylenamine isolated by Legler and by von Gieserwald.

The paper gives full account of its properties, its reactions and its method of assay.—J. pharm. chim., 15 (1917), 222.

Hexamethylenamine.—*In Pyelitis.*—I. A. Abt advises caution in the administration of hexamethylenamine in the pyelitis of infants. It should be under continuous observation and its use should be continued for an extended period. The urine should be frequently examined for blood. Abt has more than once seen cases of fatal nephritis which he believes due to the overuse of hexamethylenamine. He advises that, if given to infants under 1 year of age, it should be given in one-grain doses followed by water. This dose may be repeated four or five times daily.—J. Am Med. Assoc., 68 (1917), 1100. (W. A. P.)

Urotropine.—*A Microchemical Reagent.*—R. Vivario and M. Wagenaar report that urotropine gives with many metals characteristic double salts by which the metals can easily be identified. Plat-

inum chloride, even when as little as 0.5μ is present, yields octahedrons which are isomorphous with those obtained from iridium chloride which, however, does not react unless present to an extent of 2μ . Palladium chloride forms with urotropine very characteristic crystals which do not form mixed crystals with those obtained from platinum and being anisotropic can easily be distinguished from these. They are grouped like teeth of a saw or in small quantities like a facette. Viewed between crossed Nicols, unlike the crystals obtained from platinum, they exhibit a beautiful display of colors. By these reactions it was found that commercial palladium almost invariably contains platinum. Osmium yields crystals which are similar to those of palladium but are much more soluble than these. Gold chloride yields, with urotropine in slightly acid solutions, yellow needles. Yttrium and erbium sulphate give, in neutral or slightly acid solutions, octahedrons which are not characteristic; beryllium sulphate, zirconium chloride, thorium sulphate and vanadium sulphate in neutral solution give flocculent precipitates. Silver nitrate forms with urotropine feathery double refractive crystals which can be used for identifying silver. The double salt, which is formed when as little as 50μ of silver salt is present, is soluble in an excess of silver nitrate. Mercurous salts do not form characteristic crystals; mercuric chloride, when 4μ of the salt is present, forms columns, and mercuric nitrate in quantities of 10μ yields feathery crystals. Arsenic and lead salts form no characteristic crystals, while antimony chloride yields large octahedrons, which by the addition of potassium iodide solution are slightly colored and rendered less soluble. Tin salts, both stannic and stannous, yield octahedrons with urotropine and cannot therefore be distinguished from those obtained with antimony and those from bismuth which are octahedrons also; when, however, a mixture of crystals obtained from these three metals is moistened with caesium chloride and potassium iodide, the salts obtained from antimony and bismuth are colored blood-red, while the tin salt remains colorless. When, therefore, no red color is produced, tin is present. The crystals of the tin-urotropine salt are isomorphous with potash-alum and care should be taken not to confuse these two. Copper, cadmium and iron do not yield characteristic double salts and of the alkaline earths, only magnesium forms a double salt with urotropine in the presence of potassium iodide, occurring as thin plates.—Pharm. Weekblad, 54 (1917), 157. (H. E.)

Homatropine.—*Production of Derivatives of.*—According to D. R. P. 299,806 inactive homatropine becomes pharmacologically active by esterification with benzoic, tropic, mandelic and other organic acids, the resulting esters resembling atropine in their physiological effect. Anhydroecgonine, hitherto valueless, can thus be converted into therapeutically valuable products.—Chem. Zentr., 1917, II, 510; through J. Chem Soc. Abs. (A. V.)

Ipecac Alkaloids.—*Structure of.*—P. Karrer's study of the ipecac alkaloids confirms the work already done by Carr and Pyman. In addition, he prepared the methyl, ethyl and propyl ethers of cephaeline, finding that the methyl ether is identical with emetine. Demethylation of emetine and cephaeline give the same product, *emetolcine*, which possesses phenolic character. Emetine, on oxidation with iodine, yields an iodide of dehydroemetine, $C_{29}H_{32}O_4N_2I$. In this respect, it resembles canadine. Karrer gives in the article a preliminary outline of the emetine structure formula.—Ber.; through J. pharm. chim., 15 (1917), 260.

Ipecac Alkaloids.—*Toxicity of.*—Walters and Koch have studied the toxicity of the ipecac alkaloids psychotrine, cephaeline, cephaeline methyl ether (emetine) and the ethyl, propyl, isopropyl, butyl, isobutyl, tertiary butyl, isoamyl and allyl ethers of cephaeline. They find that the addition to the cephaeline complex of radicals of the higher alcohols markedly decreases the toxicity. Thus cephaeline iso-amyl ether is only one-fifth as toxic as emetine and only one-tenth as toxic as cephaeline. They also find that emetine is not very toxic in single doses, but is dangerous when given repeatedly in small doses over a considerable period of time.—J. Pharm. Exp. Therap., 10 (1917), 73.

Ipecac Alkaloids.—*Emetic Effect and Irritant Action.*—Walters, Eckler and Koch report a study on the emetic and irritant action of ipecac alkaloids and of the higher ethers of cephaeline cited above. They find that in cats, the emetic dose of emetine is about twice that of cephaeline and that the decrease in emetic power of the cephaeline ethers follows about the same ratio as does their relative toxicity. The emetic action depends to a certain extent upon the acid with which the alkaloid is combined. When tested on the conjunctiva of rabbits, emetine and cephaeline were found the most irritating and cephaeline iso-amyl ether the least irritating.

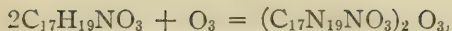
The authors also note the production of "ipecac asthma" in certain susceptible persons and as the symptoms are produced in powdered ipecac freed from alkaloids, it is to be ascribed to a vegetable protein sensitization.—J. Pharm. Exp. Therap., 10 (1917), No. 3.

Morphine and Cocaine.—*Exportations from England to Japan.*—Morphine or cocaine cannot be exported from England to Japan without certificates from the Japanese Home Office or from the Japanese authorities of the Kevantung leased territories stating that the narcotic is for medicinal use only, and only in Japan or Dairen or its vicinity.—Chem. and Drug., 89 (1917), 885. (K. S. B.)

Morphine.—*Colorimetric Assay.*—Heiduschka and Faul have tried out the Georges and Gascard and the Marquise methods of assay. In the former (iodic acid) method, instead of using a Duboscq colorimeter, they prepared a line of acid morphine dilutions from 1 in 1000 to 1 in 10,000. Equal volumes (10 mls) of these dilutions are treated with 5 mls of 5 per cent. iodic acid solution, and the yellow coloration noted after one-half minute, while morphine may be detected in a dilution of 1 in 12,500, quantitatively estimated only at concentrations between 1 in 5000 and 1 in 5500.

By the Marquise method, a one-mil sample of the morphine dilutions described above is evaporated in a small dish and the residue treated with one mil of the reagent (2 to 3 drops of 40 per cent. formaldehyde and 3 mls of concentrated sulphuric acid) and the violet solution washed into the comparison tube with 4 mls of sulphuric acid. The colors are examined in transmitted light, as by reflected light the color comparison is untrustworthy. Morphine can thus be determined in dilutions ranging from 1 in 1400 to 1 in 14,000 and if the sulphuric acid is omitted it can be detected in a dilution of 1 in 25,000. By this method two ripe poppy capsules were found to contain 0.017 and 0.068 per cent. of morphine, respectively, while the seeds were free from morphine.—Arch. Pharm., 255 (1917), 172; through Chem. Abstracts (1918).

Morphine.—*Volumetric Assay with Iodic Acid.*—J. N. Rakshit finds that if a solution of morphine is treated with an excess of iodic acid in the presence of diluted sulphuric acid, the reaction runs quantitatively as follows,



the oxygen being furnished by the iodic acid. In this reaction, however, dilution, temperature and time are important factors and after a careful study of all of these, Rakshit finds the following method most convenient:

Prepare a solution of 0.05 to 0.15 gramme of morphine or its hydrochloride or sulphate in 50 mls of water and add 5 mls tenth-normal sulphuric acid and 10 mls of 1 per cent. freshly prepared, cool starch solution. Shake well, add 5 to 15 mls of fifth-normal iodic acid (made by dissolving 5.86 grammes HIO_3 in the liter), shake thoroughly, let stand in a dark place for 15 minutes and then titrate back with tenth-normal thiosulphate volumetric solution. The number of mls of iodic acid solution consumed by the morphine multiplied by 0.0190 gives the amount of morphine in the sample taken. The end-point should be taken when the blue color is discharged for 30 seconds.

The process is not applicable for morphine in opium, as the other alkaloids present will interfere.—J. Soc. Chem. Ind., 36 (1917) 989; through Chem. Abstracts (1918).

Morphine.—*Japanese Imports.*—The Japanese imports of morphine hydrochloride and morphine sulphate during 1916 were 558,812 Oz. valued at 3,854,812 yen against 358,543 Oz. valued at 2,415,139 yen in 1915 and 180,760 Oz. valued at 750,837 yen in 1914.—Chem. and Drug., 89 (1917), 305. (K. S. B.)

Morphine.—*Methyl Derivatives of.*—If the Knorr and Pschorr formula for morphine is correct, one tri-, three di-, and three monomethyl derivatives of that alkaloid should be capable of existence. Four of these have already been prepared and described, and now C. Mannich describes the other three:

Morphine O, O-dimethyl ether, $\text{C}_{17}\text{H}_{17}\text{ON}(\text{OCH}_3)_2$, obtained from methyl codeine methochloride, as prismatic crystals melting at 140° to 141° .

Morphine methoxymethyl ether, $\text{C}_{17}\text{H}_{17}\text{ON}(\text{OH})(\text{OCH}_2\text{OCH}_3)$, obtained from the sodium derivative of morphine by treatment with monochloroacetone, as needles, melting at 94° to 96° .

Heterocodeine, or the monomethylether of morphine, in which the methylation occurs at the secondary alcoholic group, $\text{HOC}_{17}\text{H}_{17}\text{ON}(\text{OCH}_3)$. This is obtained by treating morphine methoxymethyl ether with normal sodium hydroxide V. S., and dimethyl

sulphate at 0° . The product is then acidulated with diluted sulphuric acid, then treated with potassium iodide solution and the precipitate, on treatment for two days with sulphur dioxide, yields crystals of heterocodeine, melting at 242° .—Arch. Pharm.; through J. Chem. Soc., 112, I (1917), 473.

Diacetylmorphine and Its Hydrochloride.—In a series of experiments with the above named alkaloid and its commonly used salt to determine their melting points and ash content the following conclusions are reached by Hugo H. Schaefer. In four experiments determining the melting point, the alkaloid from four different manufacturers melted sharply at 172° C. It is, however, difficult to obtain the correct melting point of the hydrochloride, owing to its decomposition upon being heated. Melting points ranged from 225° to 235° C., depending upon the rate of the raising of the temperature. Ash determinations resulted in residues well within the limits allowed by the U. S. P.—J. Am. Pharm. Assoc., 6 (1917), 140. (L. S.)

Nicotine.—*As an Insecticide.*—The pharmacological effects of nicotine on the higher animals are well understood, but hitherto nothing has been known of the effects on insects. According to the results of an investigation by N. E. McIndoo, nicotine spray solutions do not pass into the trachea nor do they penetrate the integuments of insects. The fumes from nicotine used as a fumigant, the vapors from nicotine spray solutions, and the odoriferous particles from evaporated nicotine spray solutions or from powdered tobacco pass into the trachea and are widely distributed to all the tissues. Regardless of how it is applied, whenever nicotine kills insects, as well as all other animals, it kills by paralysis, which in insects travels along the ventral nerve cord from the abdomen to the brain. The writer does not know just how nicotine paralyzes the nerve system, but he does know that it prevents the nerve cells from functioning, and that in regard to the simplest animals its presence around the cells causes the same structural changes resulting in death as observed when other animals of the same kind are deprived of oxygen. In such cases it seems to kill physically rather than chemically, but the evidence presented does not conclusively prove this view. In the higher animals it may kill by interfering with oxidation in the cells. Whether this is accom-

plished physically or chemically the writer does not know, but, concluding from the properties of nicotine, he is inclined to attribute more to its physical effects than to its chemical effects.—J. Agr. Res.; through Pharm. J., 98 (1917), 97.

Nicotine.—*Assay in Tobacco Extract.*—Thomsen recommends the method of Kirsling as more reliable than that of Ulex for the estimation of nicotine. The loss of nicotine before distillation and the formation of ammonia during distillation constitute two possible errors in the Ulex method, which are not necessarily of equal dimensions. Much more ammonia may be produced than is equivalent to the loss of nicotine and thus cause high results, if the distillate is titrated.—Chem. Ztg., 41 (1917), 476; through J. Chem. Soc. Abs. (A. V.)

Nicotine.—*Removing from Tobacco Smoke.*—Tóth and Dangelmayer state that the amount of free nicotine in the smoke of some tobaccos may be largely reduced by passing the products of combustion through cotton wool previously treated with tannin. It is claimed that the use by smokers of plugs of this material would be advantageous, by mitigating the deleterious effects of smoking.—Chem. Ztg.; through Pharm. J., 98 (1917), 189.

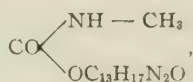
Opium Alkaloids.—*Effect on Ureters.*—According to D. I. Macht morphine and the opium alkaloids having a similar constitution increase the contraction and produce a greater tonicity of the ureter, whereas papaverine and the opium alkaloids constituted similarly produce a slowing or total inhibition of the contraction and relaxation of the tonus. In opium and pantopon, which contains the total alkaloids of opium, the effect of the morphine group preponderates. Ureteral colic is due to spasmodic contractions of the ureter caused by the irritating calculus, and hence the use of papaverine or opium is more rational than that of morphine. Furthermore, the slighter toxicity of papaverine, its tonus lowering power and its local analgesic properties suggest its local application in spasmodic conditions of the ureter.—J. Am. Med. Assoc., 68 (1917), 719. (W. A. P.)

Pelletierine.—*Definition of U. S. P. IX.*—Charles Tanret takes exception to the replacing in the definition of the new Pharma-

copœia of the name pelletierine by the word "punicine." The latter name was given by G. Righiny in 1844 to an oleoresinous extract of the pomegranate tree which has nothing in common with the alkaloids pelletierine, iso-pelletierine, methyl pelletierine and pseudo-pelletierine discovered by Tanret in 1878 to 1880.—J. pharm. chim., 15 (1917), 158.

Piperazine and Other Organic Urate Solvents.—From a review of the literature P. J. Hanzlik concludes: There is no reliable evidence to show that piperazine, in small or therapeutic doses, imparts to urine urate solvent qualities, either by direct addition or after excretion; excessive doses produce a slight but negligible increase in uric acid excretion, the same being effectively produced by sodium bicarbonate or sodium citrate; there is no reliable evidence to indicate that piperazine can remove or prevent urate deposits; diuresis is uninfluenced by even large doses of piperazine and its administration does not materially reduce the acidity of the urine; scientific evidence, though limited, and clinical opinion indicate that piperazine is valueless in gout. Hanzlik also reports that there is sufficient evidence to indicate the worthlessness of the following as urate solvents: quinic acid, quinoline, colchicum, piperidine, Urosin, Lycetol, Sidonal, Lysidin and Urol.—J. Lab. and Clin. Med., Feb., 1917, 308. (W. A. P.)

Physostigma.—*Alkaloids.*—M. Polonovski reports that the chief active principle of calabar bean is an alkaloid which he named geneserine, and which is obtained by extracting the drug with ether applying neither acid nor alkali. Eserine, generally considered as the chief active principle of the bean, is a reduction product of geneserine which contains an additional oxygen atom and is probably formed only in the manufacturing process of the alkaloids. Both alkaloids contain a urethane group. The formula of geneserine is

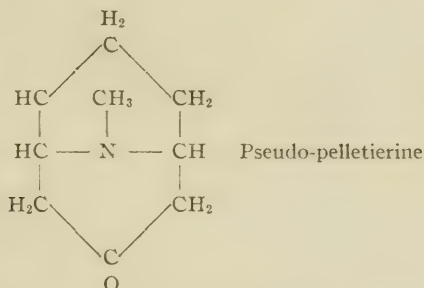


from which by splitting off of the urethane group a phenol-like base, $\text{HO}-\text{C}_{13}\text{H}_{17}\text{N}_2\text{O}$, named geneseroline is formed. Eserine yields a corresponding base named eseroline.—Bull. sci. pharmacol.; through Pharm. Weekblad, 54 (1917), 1289. (H. E.)

Pomegranate Alkaloids.—Through the investigations of C. Hess and Eichel a great step has been made towards our knowledge of the constitution of the alkaloids of pomegranate. The three bases present in the drug and first isolated by Tanret are:

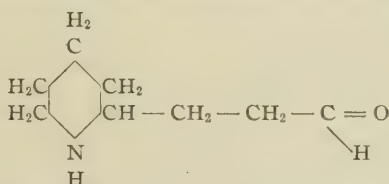
Pelletierine.....	$C_8H_{15}NO$
Methyl pelletierine.....	$C_9H_{17}NO$
Pseudo-pelletierine.....	$C_9H_{16}NO$

The constitution of the last-named base has been found by the investigations of Ciamician and Silber and of Piccini who found it to be granatanine in which a methyl group is linked to the nitrogen. Granatanine is nearly related to tropinone present in the atropine series:



Pelletierine is, according to the investigations of Hess and Eichel, a secondary amide and at the same time aldehyde which, on oxidation, yields first an oxime, then a nitrile and finally a carbonic acid, which was named pelletierinic acid and which seems to be identical with β -hexahydro-2-pyridyl-propionic acid produced synthetically in 1909 by Löffler and Kaim.

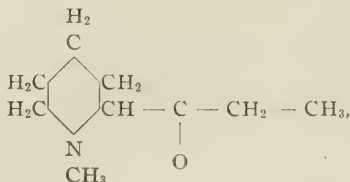
The structural formula for pelletierine therefore must be:



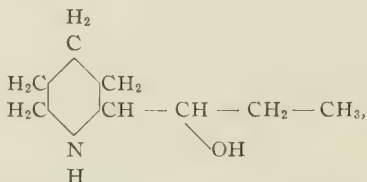
Pelletierine, an oily liquid boiling at 195° , is nearly related to coniine. Hess and Eichel succeeded in obtaining from the optically inactive pelletierine, which could be isolated only from the plant, by treating the hydrazon with sodium methylate, an optically inactive coniine which was identical with *i*-coniine isolated by Engel.

In regard to methyl-pelletierine it was established that this base is present only in the inactive form in the plant and that it is not identical with pelletierine. It is the methyl derivative of an isomer and should therefore be named methyl iso-pelletierine. Iso-pelletierine is not present in pomegranate.

Methyl-iso-pelletierine is a ketone of the formula



which is related to coniine because it forms methyl-coniine on reduction, and also to conhydrine, which is formed by oxidizing and methylating methyl iso-pelletierine. The structural formula for conhydrine therefore is



a formula which for other reasons has already been adopted by Löffler. Hess and Eichel believe that pelletierine and iso-pelletierine are intermediate products in the formation of pseudo-pelletierine in the plant.—Ber.; through Pharm. Weekblad, 54 (1917), 1456. (H. E.)

Quinine.—*Blindness from.*—Weens reports several cases of quinine amblyopia. In one case 20 grammes of quinine hydrochloride were administered per rectum by mistake for 20 grains. Vomiting, tinnitus, deafness and blindness soon set in. Retinal examination showed that the blood vessels were contracted, the whole retina was edematous, and, except at the macula, pallor was noticeable. Under nitroglycerin, strychnine and digitalis, improvement set in after a few days. Later caffeine, nitroglycerin, and strychnine were given. At the end of a fortnight some improvement in the size of the retinal blood vessels followed, and the irregularity in the lumen of the arteries slowly disappeared. At this stage iodide of stronium was given, and ocular massage carried out.—Arch. Ophthal.; through Drug. Circ., 61 (1917), 76.

Quinine.—*Disinfectant Action on Diphtheria Bacilli.*—Schaeffer reports that quinine and similarly hydrocupreine with its methyl, ethyl and isopropyl derivatives have an inhibitory action towards diphtheria bacilli in a concentration of 1 : 10,000. The antiseptic activity increases from isobutylcupreine on with increasing molecular weight until the octyl derivative is active in the concentration 1 : 750,000, diminishing progressively with increasing molecular weight until the cetyl derivative is active only in a concentration of 1 : 5000. The lethal action of the disinfectants runs mostly parallel with their inhibitory action. Quinine monohydrochlorides were more active than the dihydrochlorides. The hydrocupreine derivatives added to human serum acted as good disinfectants.—*Biochem. Z.*, 83 (1917), 269; through *J. Chem. Soc. Abs.* (A. V.)

Quinine.—*Consumption in the Caspian Region.*—Israelson states the quinine is practically the only popular remedy in the Caspian region. At Merv, nine out of ten customers at a pharmacy come for quinine. Although doubtless this demand had its origin in the success with which the remedy was used against paludism, which is endemic in this part of the world, it is now used promiscuously as a panacea. Few preparations are sold there which do not contain quinine. On the other hand, proprietary and official preparations containing that alkaloid have a large sale, also such mixtures as "yellow quinine," quinine and berberine, or "blue quinine," quinine and methylene blue, and similar compounds. The climate and the insanitary conditions of the dwellings render infectious diseases very common among the half-savage people. Many years ago, an outbreak of yellow fever carried off thousands, and the disease was only extirpated with great difficulty by the Russian Government in consequence of the ignorance and prejudices of the natives. Amebic dysentery is often met with, accompanying paludism. In these cases, quinine by the mouth is contra-indicated. In this complication it is given by hypodermic injection of the acid hydrochloride.—*Russ. P.*; through *Pharm. J.*, 98 (1917), 23.

Quinine.—*Skin Reaction to.*—Fred. Boerner, Jr., describes a skin reaction to quinine which may be of practical value to the physician as an aid in determining the existence of an idiosyncrasy to this drug.—*J. Am. Med. Assoc.*, 68 (1917), 907. (W. A. P.)

Quinine.—*Production in India.*—The output of quinine at the Government cinchona plantations in the Nilgiris Hills during the 1915–1916 year was 523,008 Oz., against 470,752 Oz. in 1914–1915. The quality was slightly inferior to that of the previous year, due to the poor yield of locally purchased bark and decreased yield of Java bark. The advance in the price of bark increased the cost of the alkaloid by 12.5 per cent. The institution issued 794,896 Oz. of quinine against 669,840 Oz. in 1914–1915.—Chem. and Drug., 89 (1917), 825. (K. S. B.)

Quinine Bisulphate.—*Decomposition.*—As quinine bisulphate is rapidly coming into extended use, Bernard F. Howard and Oliver Chick have conducted experiments to determine the temperature at which decomposition takes place, as this salt of quinine is very readily converted into quinicine or quinitoxin. The following conclusions were arrived at:

(1) The exsiccation of quinine bisulphate at 35° to 40° C. raises the limit of temperature at which decomposition is first noticed. The undried salt decomposed to the extent of 0.25 per cent. at 60° C., whereas the exsiccated salt shows no decomposition at this temperature.

(2) The addition of 50 per cent. of its weight of water at any dangerous temperature increases the amount of decomposition, while larger quantities of water retard it.

(3) Heated alone, or in very concentrated solution, decomposition is first noticed at 60° C., and increases with the temperature, amounting to 50 per cent. in 24 hours, and 75 per cent. in 48 hours, at 90° C. If the treatment be carried on in an open vessel, allowing the water of crystallization to escape, thus drying the salt, the decomposition is reduced to 17 per cent. in 24 hours.

(4) Fusing of the hydrated salt without decomposition is doubtful.

(5) Decomposition is always accompanied by a bright yellow coloration. The authors suggest the use of the bihydrobromide, bihydrochloride, or hydrochloride for hypodermic injection in place of the bisulphate.—Chem. and Drug., 89 (1917), 612. (K. S. B.)

Scopolamine.—*In "Twilight Sleep."*—In a report on 150 consecutive cases of labor to which the scopolamine-morphine treatment was applied, Dr. W. Osborne Greenwood states that in his

experience in private domiciliary practice a higher percentage of cases of complete amnesia is induced—98.66—than in the best hospital results recorded by Gauss, *viz.*, 86 per cent. In the whole series of 150 cases no maternal death occurred and only three infantile deaths—all still-born—being 2 per cent. as against 2.25 to 2.5 per cent. in general midwifery practice, and on these fatalities the scopolamine-morphine treatment had not the remotest influence. He finds also that if the treatment is carefully carried out with the vigilance which it demands on the part of the accoucheur there is no need whatever for so deep a grade of treatment as to produce “blue babies” (Oligopnœa). The most conspicuous after-effect on the mother is the remarkable absence of exhaustion and shock, “and so long as complete amnesia and not analgesia is carried out there is no risk either to mother or infant.”—Brit. Med. J.; through Pharm J., 98 (1917), 263.

Scopolamine.—*Use of Old Solutions.*—Contrary to statements by Kionka and Sachs, H. Bolten claims that 3 to 4 months old scopolamine solutions even when kept in alkali-free glass containers are liable to produce injurious by-effects when administered hypodermically in doses of as small as 0.5 Mg. Whether or not solution kept in ampuls keep better is not stated by the author.—Med. Tijdschrift v. Genesk.; through Pharm. Weekblad, 54 (1917), 556. (H. E.)

Solanaceous Alkaloids.—*Sensitive Test for.*—Dissolve 2 grammes of para-dimethylamidobenzaldehyde in 6 grammes of concentrated sulphuric acid and carefully add 0.4 gramme of water. The result is a dark yellow liquid that keeps well for 2 weeks and when one drop of the reagent is warmed on a watch glass with a trace of a solanaceous alkaloid an intense red-violet color is produced. It is sensitive to 0.0002 milligramme. Atropine, hyoscyamine and scopolamine give the red-violet color, codeine and morphine give a clear red color, quinine gives a red-brown, physostigmine and veratrine show green, while narcotine and papaverine are turned orange.—Pharmazev. J.; through J. pharm. chim., 15 (1917), 54.

Sparteine.—*Microchemical Identification of.*—O. Tunmann has studied the microchemical reactions of sparteine with a number of alkaloidal precipitants, and found that it is possible to effect this

with certainty. The best reagents are solutions of chromic acid (1 to 2 per cent.), zinc chloride (1 to 1), cupric chloride (4 per cent.), mercuric chloride, hydriodic acid and potassio-cadmic bromide. The precipitates assume characteristic crystalline forms, for details of which reference should be made to the original article.—Apoth. Ztg.; through Pharm. J., 98 (1917), 353.

Sparteine.—*Solubility of.*—A. Valeur states that the solubility of sparteine in water decreases as the temperature rises. The least elevation of temperature in a solution saturated in the cold causes a turbidity, which disappears on cooling. The presence of sodium carbonate increases the sensitiveness of the phenomenon to such a degree as to afford a delicate test for the identification of the base. The following test serves to distinguish sparteine sulphate: A 1 : 10 aqueous solution of this salt, prepared at ordinary temperatures, is mixed with an equal volume of 1 : 10 sodium carbonate solution. The tube containing the mixture is then plunged in a water-bath previously heated to 40° C., when it gradually becomes milky. On immersing the tube in cold water, the solution becomes clear again.—J. pharm. chim., 15 (1917), 359.

Stovaine.—*Pharmacology of.*—M. I. Smith and R. A. Hatcher find that in toxic doses stovaine produces death in animals by inducing immediate and simultaneous paralysis of the heart and the respiration, the action on each being independent of the other. They find that stovaine disappears rapidly from the blood stream after its intravenous injection. Stovaine is slightly more toxic than novocaine by similar modes of administration, and complete recovery does not follow the administration of toxic doses of stovaine so promptly as it does with corresponding doses of novocaine.—J. Pharm. Exp. Therap., Jan., 1917, 231. (W. A. P.)

Strychnine.—*Distinction from Quinine.*—E. Philippi reports that the characteristic color reaction observed when strychnine or its salts are treated with potassium dichromate and sulphuric acid, is interfered with if 0.04 gramme or more of quinine bisulphate is present. In this case a garnet-red, transitory coloration is noted, rapidly changing to green. With smaller amounts of the quinine salt, the strychnine reaction may be observed; it is, however, very transitory. Strychnine picrate crystals may be obtained in presence of quinine salts; they, however, lack the characteristic crystal-

line structure. The author tells us that strychnine and quinine may most readily be separated by the use of sodium potassium tartrate, insoluble quinine tartrate being separated.—Arch. Farm. Sperim.; through C. U. C. P. Al. J., 24 (1917), 88. (G. C. D.)

Strychnine.—*Elimination by the Kidneys.*—Hatcher and Smith find that strychnine appears in small quantities in the urine within a few minutes of administration, and the amount excreted is largely increased by diuresis. Intravenous injection of large doses of the alkaloid does not increase the amount of excretion. In the case of dogs, renal excretion is not sufficient to save life, no matter how active it may be. Diuresis therefore contributes very little to successful treatment of strychnine poisoning. The amount of strychnine eliminated by the kidneys by dogs agrees generally with the quantity eliminated in the same way by man.—J. pharmacol.; through Pharm. J., 98 (1917), 209.

Theobromine.—*Assay of.*—At a meeting of the Society of Public Analysts, Norah F. Elliott and G. Brewer reported that in Kunze's method and Monthulé's modification the estimation of theobromine depends on a silver estimation in the silver theobromine compound. The results are vitiated by the presence of any substance giving an insoluble silver salt, or, what is more usual, reducing silver, and the results are too high. Accurate quantitative results can be obtained by nitrogen estimations.—Pharm. J. Supp., June 16, 1917, 16.

Tyramine.—*An Adjunct to Morphine in Labor.*—H. G. Barbour has studied the effects of tyramine on the action of morphine in labor. In labor, morphine exhibits one desirable effect, analgesia, and two untoward results, namely, respiratory depression in the child and delay of labor. Experimental work at Yale having given no support to the use of scopolamine as an adjunct to morphine in labor, tyramine and similar bodies were studied. Animal experiments demonstrated that tyramine (parahydroxyphenylethylamine hydrochloride) counteracted the respiratory depression of morphine. In man, from 40 to 50 Mg. of tyramine, administered simultaneously with a therapeutic dose of morphine of 16 Mg., completely antagonized the depressant action of morphine on the respiration. The effects of morphine-tyramine on normal labor is

being studied at Yale. So far it appears that analgesia is as complete as if morphine were given alone. The respiration of the mother is increased rather than depressed and the condition of the children is quite satisfactory. Further, the uterine contractions have always been increased in frequency and in degree.—J. Am. Med. Assoc., 68 (1917), 882. (W. A. P.)

Vitamines.—*Influence of Radium Emanations on.*—C. Funk found that the activity of autolyzed yeast, exposed to radium emanation, was not in any way diminished when, compared with that of the unexposed control, injected into pigeons which had developed beri-beri on a diet of polished rice. The curative properties were unaffected. In a similar manner, radium emanation was found to have no effect on the vitamine which stimulates growth in young rats. Radium emanation has no influence on the development of Rous' chicken sarcoma, even when applied in doses exceeding those used in the treatment of cancer.—Proc. Soc. Exp. Biol. Med.; through Pharm. J., 98 (1917), 469.

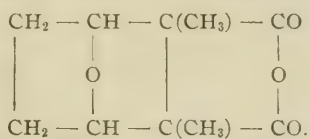
GLUCOSIDES AND NEUTRAL PRINCIPLES.

Aloe-emodin.—*Bromine Derivatives of.*—E. Léger heated 1 gramme of aloe-emodin for nine hours in a sealed tube with 3 mls of bromine. Upon opening the tube, much hydrobromic acid escaped. Heating the mixture another nine hours in a sealed tube yielded very little more hydrobromic acid. After removing excess of bromine with a current of air, washing away impurities with boiling methyl alcohol, drying and recrystallizing from chloroform, orange-yellow crystals of penta-bromo-aloe-emodin, $C_{15}H_5Br_5O_5$, melting at 278.4° , were obtained. When this compound is dissolved in alkali, tetrabromo-aloe-emodin, $C_{15}H_{16}Br_4O_5$, is obtained in bright orange-red anhydrous prisms, melting at 276.4° . This tetrabromide forms a cherry-red solution with sodium hydroxide and a fuchsin-red solution with ammonia water. The latter solution, while stable in the dark, turns violet in sunlight and when diluted loses its color after a few days.—J. pharm. chim., 16 (1917), 5.

Cantharidin.—*Structure of.*—W. Rudolph reports a study of the structure of cantharidin. Starting with the three formulæ suggested by Gadamer (See Year Book, 1914, 568) his examination of the substance, cantharidide, $C_{10}H_{14}O_3$, shows that this is a very

stable lactone and is not identical with the product obtained by the reduction of "dibromide" of cantharidin. This eliminates Gadamer's second formula. When the "dibromide" is reduced by zinc and zinc dust in acetic acid and in diluted sulphuric acid, an acid deoxycantharidic acid, $C_{10}H_{16}O_4$, in the form of crystals, melting at 160° to 165° to a turbid liquid, can be isolated. The acid forms a silver salt, $C_{10}H_{14}O_4Ag_2H_2O$, and can be converted into its anhydride by fusion or by boiling with water. This anhydride, deoxycantharidin, is a colorless friable substance, slowly volatile with steam and smells like camphor.

The "dibromide" of cantharidin was converted into a methyl hydrogen ester, $C_{11}H_{16}O_4Br_2$, melting at 122° . The "dibromide" does not give a dimethyl ester and cantharene prepared from it has a smaller exaltation of the molecular refraction than the values previously recorded. These facts incline Rudolph to the acceptance of third formula suggested by Gadamer for cantharidin:



—Arch. Pharm., 254 (1916), 423; through J. Chem. Soc. Abs. (A. V.)

Cantharidin.—*Structure and Derivatives.*—J. Gadamer discussing the foregoing paper disposes of one hindrance to the cantharidin formula printed above: the properties of iso-cantharidin and iso-cantharidic acid described by Anderlini and Ghira in 1891. Repeating the work of these two investigators, Gadamer finds that these two substances are really acetyl hydratocantharic anhydride and acetyl hydratocantharic acid, respectively. The paper describes at length the properties and derivatives of the two substances just named.

Gadamer found that the so-called *d*-cantharic acid reduced by the Mannich modification of the Paal-Skita method yields *l*-dihydrocantharic acid, $C_{10}H_{14}O_4$, melting at 264° to 267° , and having the optical activity in alcoholic solution, -52.5° . Inactive cantharic acid by similar reduction yields an inactive dihydrocantharic acid melting at 264.5° . This can be resolved by means of the brucine salt and the *l*-acid thus obtained has the optical activity -33° to -35° . When this substance in sodium hydroxide solution

is energetically reduced by hydrogen and palladium (on bone charcoal) there is obtained *l*-dihydrocantharic acid and deoxycantharidin, the latter agreeing in all ways with that obtained by Rudolph (see above) from "dibromide" of cantharidin.—Arch. Pharm., 255 (1917), 277 and 290; through Chem. Abstracts (1918).

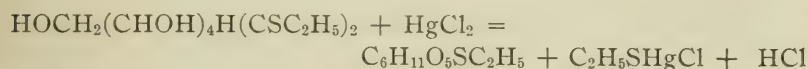
Chitin.—*Microchemical Reaction for.*—V. Vonk heats chitin for 20 to 30 minutes with strong potassium hydroxide solution. This completely converts the chitin into chitosan, from which the reddish violet coloration can be obtained in the usual manner. The method may be found to be useful for identifying insect particles of chitin, or for confirming their chitinous nature, in powdered drugs. Ber. botan. Ges.; through Pharm. J., 98 (1917) 23.

Digitalis Glucoside.—*New.*—F. Wratschko treats a few drops of the digitalis liquid under examination with a few mls of boiling orcinol-hydrochloric acid reagent (orcinol 2 Gm.; concentrated hydrochloric acid, 100 mls; ferric chloride solution, 4 drops). On shaking, the fluid turns green or blue and in greater concentration, a dark precipitate is formed. The solution is treated with an equal volume of water and on shaking with amyl alcohol, the latter is colored green to dark blue and on standing becomes from lilac to carmine-red. The reaction is very sensitive and the amount of color depends on the amount of glucoside present in the liquid. If pentoses are suspected, the glucoside should be extracted with chloroform prior to applying the test. Strophanthus preparations also show the reaction.—Z. Oesterr. Apoth. Ver.; through Chem. Abstracts, 11 (1917), 3095.

Glucosidal Syntheses.—*Preparation of Crystalline Beta-mono-glucoside of Glycerin.*—Bourquelot, Bridel and Aubrey announced in 1915 (See Year Book, 1915, 371) the successful synthesis by the biochemical method of a mixture of two β -mono-glucosides of glycerin. At that time these were not obtained in a crystalline condition; consequently the alcoholic solution was treated with ether and set aside in an ice chamber, the temperature of which was always below 5° or 6° C. Last February crystals were observed to have formed. On crushing these with a rod the whole pasty precipitate became definitely crystalline in fifteen days. Finally, small irregular spherical masses, built up of slender needles, sep-

arated. These are extremely soluble in alcohol, so they were washed with ether. They melt between 130° and 135° C. on the Maquenne block. The aqueous solution only very slightly reduces Fehling's reagent. It has a slight sweet taste, with a bitter after-flavor, that has the optical rotation of $-28^{\circ} 16'$. It is, therefore, the most levorotatory of the two mono-glucosides of glycerol. It is hydrolyzed by dilute sulphuric acid, under pressure, and also, completely by contact of the aqueous solution with emulsin. —Compt. rend.; through Pharm. J., 99 (1917), 29.

Glucosidal Syntheses.—*Preparation of Ethyl Thioglucoside.*—When sugars are treated with mercaptans in the presence of hydrochloric acid a condensation product, a *mercaptol*, is obtained. Schneider and Sepp find that when such a dextrose ethyl mercaptal is treated with mercuric chloride, an ethyl thioglucoside is produced by the following reaction:



This thioglucoside occurs in needles melting at 153° , having the rotation, $\alpha_D = +120.8^{\circ}$, forming a tetracetate melting at 63° .—Ber.; through J. pharm. chim., 15 (1917), 288.

Glucosidal Syntheses.—*Preparation of Galactobioses.*—Bourquelot and Aubrey announced (See Year Book, 1916, 394) the synthesis of a galactobiose by means of the action of emulsin on galactose. Recently they found that this, after being set aside for several months, had separated crystals. Further examination has led to the discovery that two isomeric galactobioses are present, separable by their different solubility in ethyl and methyl alcohols. This newest galactoside crystallizes in stellate micro-needles, and has a faintly sweet taste, resembling that of lactose, it melts at 180° C. It is dextro-rotatory, and its optical activity increases after it has first dissolved. In this respect it differs from its isomers, the solutions of which show diminution of its optical rotation on standing. The new galactobiose has the $\alpha_D + 35.01^{\circ}$, when stable, after drying at 110° C. It is hydrolyzed by sulphuric acid under pressure, and also by contact with emulsin in presence of water, at the ordinary temperature. It is noted that two glucobioses are known, which are hydrolyzed in a similar manner by emulsin, gentiobiose $\alpha_D + 10^{\circ}$, and cellobiose $\alpha_D + 33.3^{\circ}$; with

these the above new sugars may be taken to correspond, galactobiose A, $\alpha_D + 35.05^\circ$, and galactobiose B, $\alpha_D + 53.05^\circ$.—Compt rend.; through Pharm. J., 98 (1917), 375.

Glucosidal Syntheses.—*Preparation of Glucoside of Glycol.*—Bourquelot, Bridel and Aubrey describe their attempts to synthesize with the aid of emulsin pure glucose and glycol. Both a mono- and a di-glucoside are possible, but of these only the mono-glucoside was definitely obtained. The mother-liquor from the latter gave indications of the presence of the di-glucoside, but it was not isolated in pure form.—J. pharm. chim., 16 (1917), 353.

Glucosidal Syntheses.—*Preparation of Glucoside of Dihydrocupreine.*—P. Karrer finds that when this alkaloid is treated with acetobromoglucose in the presence of diluted sodium hydroxide, there is produced the tetraacetylglucoside of dihydrocupreine (m. p. 95° to 102° ; $\alpha_D -1.88^\circ$) and when this is treated with half-normal sodium hydroxide V. S., the non-acetylated dihydrocupreine glucoside is obtained. This glucoside is amorphous, melting at 160° and having an optical rotation of $\alpha_D = 160^\circ$.—Ber.; through J. pharm. chim., 15 (1917), 288.

Glucosidal Syntheses.—*Preparation of Menthol and Resorcin Compounds.*—Fischer and Bergmann have prepared menthol glucosides by heating together, at 100° to 105° , 50 grammes of beta-acetobromoglucoside, 110 grammes of levo-menthol and 20 grammes of quinoline, the latter serving as catalytic. The product obtained is a mixture of several acetates of the alpha- and beta-glucosides. From it, the author isolated:

Tetra-acetyl beta-menthylglucoside, long needles, melting at 131° to 132° .

Beta-menthylglucoside, large plates, melting at 75° to 76° .

Tetra-acetyl alpha-menthylglucoside, stellate groups of prisms, melting at 82° to 83° .

Tri-acetyl beta-menthylglucoside, radiating needles, melting at 143° .

Tri-acetyl alpha-menthylglucoside, large prismatic plates, melting at 99° to 100° .

Alpha-menthylglucoside, prisms, melting at 150° to 160° .

Emulsin and the enzyme of bottom yeast also produce the fore-

going synthesis and in addition, the authors prepared by similar methods:

Penta-acetyl beta-resorcin glucoside, long radiating needles, melting at 118° to 119° .

Beta-resorcin glucoside, which is already described in chemical literature.—Ber.; through J. pharm. chim., 16 (1917), 385.

Glucosidal Syntheses.—*Preparation of Phenol Compounds.*—

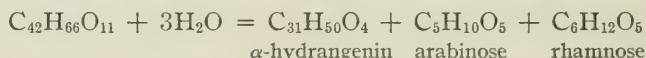
By the action of acetobromglucose on phenol sodium, a method originated by E. Fischer, only beta-glucosides, *i. e.*, which are hydrolyzed by emulsin, are obtained. The same author found that when a mixture of acetobromglucose and quinoline is heated on the water-bath with an excess of phenol a good yield of tetracetylphenol-glucoside is obtained. This product seems to be a mixture of the well-known beta compound with a strongly dextrogyrate isomer which, after splitting off the acetyl groups, yields a phenol glucoside which is hydrolyzed by invertin and therefore is an alpha-glucoside. In an analogous manner hydroaromatic alcohols like menthol or aliphatic alcohols like methyl alcohol can be converted into alpha- and beta-glucosides. Up to the present time, alpha-glucosides have not been found in plants.—Ber.; through Pharm. Weekblad, 54 (1917), 103. (H. E.)

Glucosides.—*Artificial Production in Plants.*—Ciamician and Ravenna found that when certain germinating seeds are treated with substances like saligenin, benzyl alcohol, etc., glucosides are produced artificially. The seeds used were those of maize, wheat, beans, lupine, and vetch. When germinating maize seeds are moistened with a 0.1 per cent. solution of saligenin, salicin is formed within 23 days. The same results are obtained when branches of grown plants are inoculated with saligenin. By treating beans or maize seeds during germination with benzyl alcohol a substance was obtained which on hydrolysis with hydrochloric acid yielded benzyl alcohol and a sugar. Hydroquinol is toxic to maize but not to beans. Young bean sprouts treated with this phenol yielded a glucoside which is probably arbutin. The author also inoculated gallic acid, tannic acid and pyrocatechol into young plants but no results were obtained because these substances acted as poisons.—Ann. chim.; through Pharm. Weekblad, 54 (1917), 1174. (H. E.)

Ouabain.—*History.*—Catillon claims priority for the preparation of this glucoside, having exhibited it at a meeting of the Société de Thérapeutique in 1887 as the crystalline product from *Strophanthus gratus*. In December, 1888, Arnaud published an analysis of the same principle and showed that it was the same glucoside as ouabain which had been isolated from *Acokankera Ouabao*.—J. pharm. chim., 16 (1917), 180.

Saponins.—*Composition of.*—A. W. van der Haar reports on his further work on the saponin of *Polyscias* species, of ivy and of *Saponarin* and *Aralia* species, as well as on senegin and digitonin. He finds that *Polyscias* saponin hydrolyzed with 5 per cent. sulphuric acid yields 30 per cent. of arabinose, 37.6 per cent. of dextrose and 35 per cent. of sapogenin. The latter, $C_{26}H_{44}O_4$, was obtained in rhombic crystals, melting at 324° , contained neither carboxyl, hydroxyl, nor methoxyl groups, but did contain a lactone group.

The crystalline ivy saponin, $C_{42}H_{66}O_{11}$, hydrolyzed as follows:



Hydrangenin occurs in crystals, melts at 325° to 326° and contains one lactone and 2 hydroxyl groups.—Biochem. Z.; through J. pharm. chim., 15 (1917), 261.

Solanin.—*Constitution of.*—Heiduschka and Sieger have examined solanin, obtained from the shoots of the potato. It has an uncertain melting point, due to its tendency to decompose; it has the formula $C_{52}H_{91}O_{18}N$; its solution in 2 per cent. hydrochloric acid has the rotation $\alpha_D = -42^\circ 16'$. On hydrolysis with 2 per cent. hydrochloric acid, it splits into one molecule of dextrose, one of galactose, one of rhamnose and one of solanidin. The latter has the formula $C_{34}H_{57}O_2N$ and melts at 207° . When it is treated with concentrated hydrochloric acid, solanicin ($C_{34}H_{55}ON$) is obtained.—Arch. Pharm.; through J. pharm. chim., 16 (1917), 382.

Tannin.—*Iodine as a Microchemical Reagent for.*—Sperlich observed that iodine, which may enter into cells in traces without injury to the living plasma, forms with the tannin dissolved in the cell-sap gradually resistant characteristic substances colored brown

and representing probably oxidation products. The sections may be subjected to other staining operations. If other substances, *e. g.*, oils, resins, etc., that also fix iodine, are present, iodine can usually be removed by alcohol of various concentrations.—*Ber. botan. Ges.*, 35 (1917), 69; through *J. Chem. Soc. Abs.* (A. V.)

Tannin.—*Amount in Pacific Coast Trees.*—H. K. Benson and Frank M. Jones analyzed ground slab-wood of Douglas fir immediately after felling, and again after standing for one year. On a moisture-free basis the tannin content was found to have increased from 5.92 to 7.50 per cent. Analysis of other Pacific coast trees showed the following results:

	Wood	Bark
Western Larch.....	6.7	10.6
Western yellow pine.....	8.9	10.9
Western Hemlock.....	1.0	10.93
Dogwood.....	1.3	1.7
Cottonwood.....	1.8	4.7
Alder.....	0.7	3.3

—*J. Ind. Eng. Chem.*, 9 (1917), 1096.

(G. D. B.)

COLORING MATTERS.

Dyes.—*Artificial.*—In an illustrated article, T. H. Norton presents their evolution in the United States and how American workers are overcoming the difficulties of coal-tar chemistry. There are 5 stages: (1) Bituminous coal is submitted to destructive distillation; (2) coal tar is condensed and separated; (3) coal tar is submitted to fractional distillation and about 18 distinct chemical compounds are separated; (4) these intermediates yield the dyes; (5) the resultant product undergoes mechanical treatment. The greatest difficulties are encountered in the manufacture of the intermediates, which difficulties have been mastered by the German and Swiss manufacturers, who have co-ordinated all the multitude of factors, scientific, technical and commercial. Herein lies the secret of their ability so largely to dominate the world's trade in artificial dyes. Through the thorny mazes of this chemical jungle are now struggling hundreds of American coal-tar chemists, determined to achieve as complete a grasp of the complicated industry as their professional rivals on the banks of the Rhine.

Prof. Norton also gives an explanation of the different chemical operations as, for instance, nitration, reduction, sulphonation, chlorination, oxidation, caustic fusion, alkylation, condensation, diazotizing and coupling, carboxylation, liming and fusing with sulphur and sulphides. For particulars, the original should be consulted.—*Sc. Am.*, July 21, 1917, 40. (O. R.)

Dyes.—*As Sensitizers.*—H. Waago describes the experiments of A. A. Meisling, dealing with the hardening produced when various substances are added to gelatin, gum and like bodies, and exposed to the influence of light. He found that the hardening effect is produced by erythrosin, auramine and a number of other aniline dyes, in addition to the chromium compounds, which are usually used as hardening agents, in the carbon and gum processes. The formation of formaldehyde is said to be responsible for the hardening. Papers sensitized with erythrosin can readily be made by allowing the tissue to remain in contact, for several minutes, with a solution of the dye made by dissolving 1 part in 10,000 parts of water. Neither the gum nor carbon paper is sensitive when perfectly dry, the former, however, requiring only a very small amount of moisture to render it active. The latter needs moistening to a somewhat greater degree. It is claimed that both papers are equal in value to such as have been sensitized with chromium compounds.—*Amator Fotografen*; through *C. U. C. P. Al. J.*, 24 (1917), 102. (G. C. D.)

Dyes.—*British Production of.*—Although it has not been possible to turn all the dyestuffs made by German firms, it is gratifying to note that British chemists and chemical engineers have made rapid progress. There is also a much larger supply of intermediate products. The manufacture of aniline, which forms the base for the most important black, has been taken up by certain colliery proprietors who distil their own coal. Indanthrene blue, discovered in 1900 by Dr. René Bohn, a French-Swiss chemist in the employ of the Badische Company, is now manufactured on a large scale in England. This blue is the most essential of the modern vat dyes, so valued by the cotton dyer and calico printer on account of its extreme fastness.

Another important blue, alizarin saphirol, principally used in the worsted industry, will shortly be put on the British market.

This was discovered by the Alsatian chemist, Dr. Robert Schmidt, while in the employ of the Beyer Company.—*Sc. Am.*, May 19, 1917, 509. (O. R.)

Dyes.—*Dehydration of.*—Investigations, specially interesting from a phase-rule point of view, upon the dehydration of some hydrated dyestuffs, have been conducted by J. C. Phillips. Taking the three-phase system—anhydrous salt, hydrate and water-vapor—a definite equilibrium pressure of vapor is reached which is independent of the relative quantities of solid phase present. Thus, when plotting the curve of pressure of water-vapor against water held by 100 Gm. of salt, a discontinuous curve is obtained in the cases of hydrate formation, but in certain special cases, such as with the zeolites and with magnesium platinocyanide, where absorption or some such phenomenon takes place, a continuous curve is obtained. Phillips has investigated the dyestuffs methylene blue, crystal violet, and pararosaniline hydrochloride, exposing a weighed quantity to the action of varying strengths of sulphuric acid in a special apparatus to reduce the possibility of suspended transformation to a minimum, and the results obtained were communicated in the paper.—*Chem. and Drug.*, 89 (1917), 193. (K. S. B.)

Dyestuff Statistics.—B. Salkover in a paper read before the Cincinnati Branch gives a résumé of present-day articles upon dyestuffs. He first describes the various products obtained from coal by destructive distillation and their separation. He then mentions the more common intermediates in the order in which they are obtained and enumerates the essential features for a successful coal-tar dyestuff industry. The manufacture of one intermediate, toluidine, and one dye, magenta, is given. Finally the great strides which the industry has taken is described as well as the still latent possibilities in the future.—*J. Am. Pharm. Assoc.*, 6 (1917), 528. (H. H. S.)

Acriflavine and Brilliant Green.—*Antiseptic Action of.*—Browning, Gulbransen and Thornton say that the properties which it is desirable for an antiseptic to possess depend on the uses to which it is to be put. Thus for the disinfection of fluids, excreta, utensils, etc., a rapidly acting substance is desirable and its irritant properties are not necessarily disadvantageous. For use in in-

fectured wounds or in prevention of infection, rapidity of action is not essential and the absence of irritant or destructive action on the tissues or leucocytes is most important.

All of the acridine group of compounds are relatively free from such irritant or destructive properties and acriflavine and proflavine especially are devoid of such actions. These two substances, along with brilliant green, are relatively slow in developing their antiseptic actions. The two flavines, unlike all other antiseptics so far tested, are not only not reduced in antiseptic activity by the presence of serum, but are actually decidedly enhanced. When used in wounds both acriflavine and proflavine at first inhibit the growth of bacteria and then later destroy the organisms and do not to any appreciable extent interfere with phagocytosis or act on the wound tissues. For these reasons, combined with their marked degree of antiseptic activity, they are specially suited for use in the disinfection of wounds. For this purpose they should be applied in such a way as to permit of their action being continued over periods of many hours; hence should be used on compresses or to saturate wound packing, rather than by one of the methods designed to renew the antiseptic frequently. This is especially true inasmuch as their activity is enhanced by the presence of serum.

Brilliant green, on the other hand, is reduced in activity by serum and must be renewed frequently. It is therefore best applied by the approved method of Carrel in 1 : 2000 solution in water. All three of these antiseptics are little known and their value is not yet appreciated, but their advantages over the substances in common use are so great that their use should be adopted, bearing in mind the most suitable methods of application. It must be remembered, that no antiseptic, however potent, is capable of producing satisfactory therapeutic antiseptics in the presence of heavily infected dead or badly damaged tissues, and for successful results each must be brought into immediate contact with the tissues to be sterilized. Therefore in every case preliminary surgical cleansing of the wound, including the complete removal of foreign bodies and dead or badly contused tissues, is an essential phase of the treatment.—Brit. Med. J.; through Am. Drug., 65 (1917), 400.

Acriflavine Paste.—*As Wound Dressing.*—C. J. Bond reports that, owing to the scarcity of acriflavine, it has been prepared in Leicester in the form of a paste, or cream, on the lines of the B. I. P.

method recommended by Rutherford Morison, and the results of its use in these forms are so far encouraging as to justify a wider trial. Several different forms of cream, or paste, have been tried. (1) Acriflavine paste made by neutralizing stearic acid with sodium carbonate in the proportion of 1 part of the latter to $1\frac{3}{4}$ parts of the former, with the addition of 0.1 per cent. of acriflavine. The soapy compound so prepared is canary-yellow in color and firm in consistence. (2) Acriflavine gelatin is made by heating French gelatin in water, with the addition of acriflavine 0.1 per cent. The consistence of the jelly is determined by the amount of water used. (3) Acriflavine starch mucilage is made by adding boiling water to starch, with the addition of 0.1 per cent. of acriflavine; one part of starch to ten of water forms, when cold, a thick mucilage. Of these, acriflavine stearate soap paste has been chiefly used so far, and may possibly be increased in antiseptic strength with advantage.—Brit. Med. J.; through Pharm. J., 99 (1917), 102.

Aniline.—*Colorimetric Assay of.*—E. Elvove determines aniline in the air in industrial establishments, by aspirating ten liters of the air through 10 mils of water in a suitable absorption bulb, and acidulating the water with sulphuric acid. After a preliminary test to determine roughly the concentration, the solution is diluted to between one part in 285,000 and one part in 2,000,000. Twenty mils of this solution are mixed with 1 mil of calcium hypochlorite solution containing 0.1 per cent. of available chlorine. After two minutes, one mil of N/1 sodium hydroxide solution is added and the mixture allowed to stand for ten minutes. The color so developed is compared with that developed by a series of standards prepared from an aqueous solution of aniline containing one gramme per liter.—J. Ind. Eng. Chem., 9 (1917), 953. (G. D. B.)

Aniline.—*Poisoning by.*—William Lintz states that when aniline is inhaled in small quantities for a long period, aniline fumes give rise to symptoms of chronic poisoning, and one must always bear this in mind among dye workers, when there is no other explanation for the symptoms. In such cases, the sweat may be red or violet. From 10 to 25 grammes is the fatal dose of aniline. He reports a case.—J. Am. Med. Assoc., 68 (1917), 692. (W. A. P.)

Aniline.—*Production of Tumors by.*—Long exposure appears to result sometimes in the development of tumors of the bladder, with

or without the symptoms of chronic anilism. In Germany many such cases have been observed in past years. At first sign of trouble with urine or bladder in aniline workers, the advisability of careful cystoscopy should be considered.—J. Am. Med. Assoc., 69 (1917), 204. (W. A. P.)

Brilliant Green.—*As an Antiseptic.*—C. H. S. Webb states that good results are obtained in the treatment of various forms of war wounds by a solution of brilliant green, 1 in 1000 in normal saline solution, in respect of the following points: It is an active and efficient antiseptic, is non-irritant, acts well in the presence of serum, possesses definite "auxetic" properties, and stains dead tissue green, and thus may guide the surgeon as to what to excise. As it is soluble in "saline," it can be used in conjunction with the "salt-pack," and it can be used after the method of Carrel.—Brit. Med. J.; through Pharm. J., 99 (1917), 53.

Brilliant Green.—*As an Antiseptic.*—A. Leitch finds that this dye is five to ten times as actively bactericidal as mercury bichloride. Since, however, these experiments were done *in vitro*, the efficacy of the substance, when used in the presence of the serum in the tissues of wounds, had to be determined by clinical experience; the result was that the drug proved to be of great value. It was used in a solution in the proportion of one to 1000, the solvent being distilled water, normal or hypertonic salt solution as desired. Wounds were first cleaned with dry gauze, and an ounce or so of the solution was introduced into the wound, which was then packed with gauze saturated with the solution. The dressings were changed daily or oftener in badly infected cases for a few days. The first effect observed was the total disappearance of foul smell. The dead tissues were found to have taken up the dye, while the living ones remained unstained, giving a clear differentiation, so that dead tissues could readily be removed. After a few days fresh, healthy granulations sprang up and healing proceeded rapidly in most cases. The dye seemed to have a much greater avidity for bacteria and dead tissues than for other elements in the wounds. It also proved destructive to anaerobic organisms. In a few cases it was followed by the usual favorable effects for a few days, after which the granulations became pale and unhealthy. Then change to iodine water or other dressing brought about prompt healing. In some cases brilliant green failed altogether of

good effect, but such cases resisted all other measures. The disadvantages of the drug were its staining properties for clothing and the hands, although the stain could readily be removed by alcohol or even water. It did not produce toxic effects and seemed to act as a decided stimulant to granulation tissue.—Brit. Med. J.; through Am. Dr., 65 (1917), 111.

Carotinoids.—*Detection in Plants.*—Van Wisselingh assumes the existence of various carotinoids finding often two in the same preparations, and suggests the use of saturated solutions of antimony trichloride, of zinc chloride in 25 per cent. hydrochloric acid, of saturated solution of anhydrous aluminium chloride in 38 per cent. hydrochloric acid and (for obtaining crystals especially) Molisch's potassium hydroxide method.—Flora, 177 (1917), 371; through J. Chem. Soc. Abs. (A. V.)

Chlorophyll.—*In Animals.*—P. P. Podjapolsky has published his investigations in a book "On Chlorophyll in Animals and on the Fate of Chlorophyll in the Animal Organism," Moscow, 1916. He finds that a green pigment giving an absorption band between the lines Band C of the spectrum can be extracted from the wings and elytra of a number of Orthoptera, and from the skin of some frogs. As this band coincides exactly with that of an extract of a green leaf, he concludes that chlorophyll is present in these animals. He suggests that chlorophyll in animals may be produced *de novo* by the animal, or it may be derived from ingested plant material escaping digestion, or it may be the result of symbiosis. It is, however, surprising that the author makes no attempt to explain his use of the term chlorophyll, and gives no reference to the work of Willstätter, who has clearly shown that crude chlorophyll contains 2 green and 2 yellow pigments.—Sc. Am. Suppl. No. 2186, Nov. 24, 1917, 327. (O. R.)

Flavine and Brilliant Green.—*Antiseptic Action of.*—Browning, Gulbrandsen, Kennaway and Thornton report results of a series of researches on a number of old and new antiseptics. Having defined the properties of an ideal antiseptic as consisting of (1) great potency against all micro-organisms in the presence of protein material—for example, serum; (2) no deleterious effect on phagocytosis; (3) absence of irritant action on living tissues in general, so

that it may be applied to delicate surfaces, such as mucous membranes—it is stated that in the case of all antiseptics in common use a concentration which is sufficient to cause death of the organisms is also detrimental to phagocytosis. “Thus, carbolic acid kills organisms and inhibits phagocytosis at a concentration of 1 : 250 to 1 : 500, and mercury bichloride exerts both effects at 1 : 7000 to 1 : 10,000. On the other hand, brilliant green kills cocci at 1 : 30,000 and only inhibits phagocytosis at 1 : 2000. Finally, flavine kills both cocci and *B. coli* at a concentration of 1 : 100,000, whereas to affect phagocytosis a concentration greater than 1 : 500 is required.” “Taking the whole of the results in conjunction, the following points emerge: Of all the compounds examined, the compound flavine stands out as possessing the highest sum of desirable properties for therapeutic purposes, and tested clinically, in the casualty department of the Middlesex Hospital the results as regards both flavine and brilliant green have been eminently satisfactory, and the indications are that they will largely supersede the toxic antiseptics at present employed. Flavine, which is likely to be the more generally useful of the two, is diamino-methyl-acridinium chloride, and was originally prepared by Benda at the request of Ehrlich, and was found to have a very marked effect on trypanosome infections. Attention was first drawn by Browning and Gilmore to the powerful action of this substance on bacteria. On account of its trypanocidal action the compound was called trypanoflavine, but as its range of use promises to be much wider it is more convenient to denote it simply as flavine. It is a fairly stable substance, and solutions may be boiled or heated up to 120° C. in the autoclave.” Hitherto the preparation of flavine has been worked out by Drs. Barger and Ewins in the chemical laboratory of the department of biochemistry and pharmacology of the Medical Research Committee, but arrangements have now been made for the commercial production of the compound on a larger scale. The products will be tested biologically at the Bland-Sutton Institute of the Middlesex Hospital, and will be available for trial on application to Dr. Browning on behalf of the Medical Research Committee.—*Brit. Med. J.*; through *Pharm. J.*, 98 (1917), 73.

Flavine.—As *Mouth Wash Constituent*.—F. M. Wells recommends the following antiseptic mouth washes;

1. Quinine hydrochloride.....	5 Gm.
Sodium desoxycholate.....	40 Gm.
Glycerin.....	250 mls
Water to.....	1000 mls

This was used in the form of a fine spray for the throat and nose for some months in cases of scarlet fever, which showed that septic throats clear up with it at least as rapidly as with any other form of treatment.

2. Sodium desoxycholate.....	gr. i.
Quinine ethylcarbonate.....	gr. $\frac{1}{3}$
Ol. Menthae Pip.....	m. $\frac{1}{20}$
Glycyrrhiz ammon.....	gr. 2
Also with flavine 1 : 1000.	

This is made up in tablets by Messrs. Allen and Hanburys. Judging from the chemical action of the desoxycholate and quinine tablet, it should be an excellent treatment for infected throats, as in the strength used in these tablets all the pneumococci strains are easily destroyed without causing any irritation on the mucous membrane. And by the use of these tablets amebæ are very easily cleared out of the mouth, as has been proved in cases of pyorrhea caused by amebæ.

3. Desoxycholate.....	2 per cent.
Quinine.....	0.25 per cent.
Flavine.....	1 in 2,000

As regards the checking of the development of bacteria in the mouth, this solution gave the most favorable results.—Brit. Med. J.; through Pharm. J., 99 (1917), 125.

Flavone Derivatives.—*Function in Plants.*—Shibata, Nagai and Kishida, by means of the following test, have been able to demonstrate the presence of flavone derivatives in almost all plants: A few mls of the hot alcoholic extract of the tissues are heated with a globule of mercury the size of a pea, a small amount of magnesium powder, and a few drops of strong hydrochloric acid. Reduction takes place, with a copious evolution of hydrogen and the production of a red color. The intensity of the latter indicates the amount of flavone present. It is found in the epidermal tissues, and in the peripheral parenchyma of the aerial parts of mosses, ferns, grasses, conifers, palms, and angiosperms. It is suggested that it plays an important part in plant life, since the flavone derivatives, dissolved in the sap, absorb the untra-violet rays of light in the exposed organs, and so protect the biochemical

activities of the protoplasm. Plants growing in tropical or Alpine regions are, therefore, rich in flavones, unless otherwise protected from excessive illumination. The green leaves of deciduous trees which produce anthrocyanin in autumn contain considerable quantities of flavone derivatives. When these are reduced the anthrocyanins formed occasion the change of color in the leaves which produce the various autumn tints.—J. Biol. Chem.; through Pharm. J., 98 (1917), 275.

Fustic.—C. D. Mell in an illustrated article describes the source of this dye wood, which comes from *Chlorophora tinctoria*, a medium sized tree growing in Mexico, Central and South America. After felling, the trunk, larger branches and white sap-wood are removed, as the heart-wood is the only portion containing the dye. This is bright yellow but soon turns darker by exposure to air and light. The wood is very hard and weighs about 50 pounds to the cubic foot. The transportation of these logs from the stump to the place of loading on the boats is the most difficult part of the work, which is accomplished by two-wheeled carts and oxen.

The history of the use of fustic wood dates back to the middle of the 17th century. In 1840 England alone consumed 6000 tons, valued from \$40 to \$60 a ton. In 1905 only 4371 tons of fustic wood entered the United States ports, while during the year ending June 30, 1916, 17,469 tons, valued at \$289,913 were imported, the largest quantity and value in the history of the industry, owing to the shortage in aniline dyes. Fustic wood is imported in logs, which are chipped and ground here for use in the dyeing industry, especially for the manufacture of an aqueous extract, paste or lake. A concentrated decoction has a reddish yellow color, and a diluted one is orange-yellow. Maclurin, the coloring principle, dissolves readily in water. Acids change the color to a pale yellow, and metallic salts produce precipitates of a yellow or greenish yellow tint. Fustic decoction produces on goods a yellow color with a dull brownish cast, which is permanent in the air. The mordants, alum, tartar and tin chloride, fix and lighten this color, while sodium chloride and calcium sulphate render it darker.

Fustic dye is also employed to produce shades of yellow, brown, olive and green with appropriate mordants. It is particularly adapted for the dyeing of khaki shades. The demand has largely increased because the uniforms of our soldiers and the tent cloth

are dyed with fustic extract.—Sc. Am. Suppl. No. 2190, Dec. 22, 1917. (O. R.)

Hexanitrophenylamine.—*Dermatitis from.*—A large number of cases of dermatitis have followed contact of the unprotected skin with a yellow powder contained in the bombs dropped by the enemy during the recent air raid. J. H. Sequeira reports on 59 such cases. The substance causing the eruption is stated to be hexanitrodiphenylamine. Contact with this stains the skin deep orange; in about nine days afterwards intense irritation develops; then an eruption of vesicles the size of a hempseed, sometimes forming large confluent blebs as it increases. These may become infected. The eruption reaches its height about the fourth or fifth day. Occasionally the face is involved, but in the majority of cases the hands and feet were affected. This dermatitis is closely similar to that occasioned by the dye which has been known to be used for cheap brown shoes. This is ammonium hexanitrophenylamine sold under the names "aurantia" and "imperial yellow." In consequence of the severe dermatitis it has caused, its use as a dye has been forbidden. It follows that great caution should be exercised in handling any material which has been contaminated with the contents of bombs. If any portion of the powder has come in contact with the skin, it should at once be removed and the part washed with a dilute solution of sodium bicarbonate. The wearing of ordinary gloves when handling this material should be avoided. In many cases where gloves were worn the eruption proved to be much more severe than where the bare hands were used. The best local application to the eruption, after it has developed is: Calamine, 70 grains, lime water and olive oil, of each one ounce.—Brit. Med. J.; through Pharm J., 99 (1917), 88.

Indigo.—*Indian Industry.*—The Indian government has engaged an expert to study indigo production with a view of devising means of standardizing the natural product, which will enable it to compete with the synthetic dye. By selection it is hoped to get a superior type of a plant with a large yield of leaf. The rise in the price of natural indigo to 5 times the pre-war figure encouraged the expansion of the indigo area.—Sc. Am. Suppl. No. 2158, May 12, 1917, 304. (O. R.)

Indigo.—*Cultivation in India.*—The total area under indigo in the province of Bihar, Madras, and the United Provinces increased from 148,000 acres in 1914–1915 to 314,300 acres in 1915–1916, and has further increased to over 600,000 acres up to May, 1917. —Chem. and Drug., 89 (1917), 460. (K. S. B.)

Methyl Red.—*Use as Indicator.*—F. Lehman and G. Wolff examined methyl red as to its usefulness as indicator and report the following results: Methyl red, which is to be preferred to dimethylazobenzene and methyl orange in the titration of bases, is also useful for titrating weaker acids such as oxalic and picric acid where methyl orange cannot be used. Alkali salts of weak acids such as sulphites cannot be directly estimated acidimetrically with methyl red. Salts of very weak acids, borates and cyanides can be titrated with alkali in the presence of methyl red. The color change from red to yellow and *vice versa* is very sharp; intermediate orange tints as produced when applying methyl orange are not obtained. Methyl red as indicator is best used by adding to 100 mls of the liquid to be titrated 2 to 3 drops of a 0.1 per cent. solution of the dye. Rapp also found that methyl red can be used generally as indicator and that it is especially useful in the titration of alkaloidal residues, because the extractive matter usually accompanying the alkaloids does not interfere with the color change.—Arch. Pharm. and Pharm. Zeit.; both through Pharm. Weekblad, 54 (1917), 1456. (H. E.)

Methylene Blue.—*A Reagent for Sugars.*—Liebers uses methylene blue (which is decolorized by reducing sugars) for the detection of glucose in urine. To 5 mls of a 0.1 per cent. methylene blue solution, 10 to 20 drops of caustic potash solution are added, followed by 5 to 6 drops of the urine under examination. The mixture is boiled, when in the presence of sugars, the liquid is decolorized; the rapidity with which decolorization takes place being in proportion to the amount of sugars present in the urine. By shaking the decolorized liquid with air the blue color is restored.—Med. Wochschr.; through Pharm. Weekblad, 54 (1917), 417. (H. E.)

Pyocyanin.—*Constitution of.*—Pus and culture media containing *Bacillus pyocyaneus* are colored blue, the coloring principle, according to Lederhose, possessing the empirical formula $C_{14}H_{14}NO_2$. Madinaveitia has again isolated the coloring matter by extracting

a peptone bouillon containing well developed cultures of the bacillus, with chloroform in the presence of an acid, and obtained the pyocyanin in the form of blue needles. He gives the empirical formula of the hydrochloride (which is soluble in water with a red color, and turns blue on the addition of an alkali) as $C_{60}H_{59}N_{10}Cl_5O_3$.—Bull. soc. chim.; through Drug. Circ., 61 (1917), 132.

Tschirchin.—A *New Constituent of Cinchona*.—C. Glücksmann extracted a green coloring matter from the bark of *Cinchona succubra* by the following method: The bark in a coarse powder is heated on a water-bath with an equal weight of glycerin and is then extracted in a Soxhlet apparatus with warm methyl alcohol. The dark brown extract on cooling deposits crusts and upon washing these on filter paper with cold methyl alcohol, there remains a green coloring matter, sparingly soluble in cold methyl alcohol, but soluble in ether. This coloring matter (tschirchin) is not chlorophyll, but it may be related to thalleioquin resin.—Pharm. Presse; through Chem. Abstracts, 11 (1917), 1724.

ALBUMINOIDS.

Albumin.—*Estimation of Gelatin in.*—Albumin is quite frequently adulterated with gelatin. The methods generally applied for estimating albumin by means of tannic acid or copper hydroxide cannot be used because gelatin is precipitated also. Striegel found that by the following method good results are obtained: 2.5 to 5 Gm. of the substance are boiled in a 500 mil graduated flask with 200 mils of water for 4 to 5 hours, by which all collagen is converted into gluten. One gramme of tartaric acid is then added and the mixture is again heated for 30 minutes. Thus a solution is obtained which does not gelatinize in the cold. The liquid is then nearly neutralized when acid albumin is precipitated while most of the albumose remains in solution and is precipitated together with the albuminoids by the addition of 10 to 20 mils of a diluted zinc sulphate or copper sulphate solution. After adding to the mixture sufficient water to obtain 500 mils, the liquid is filtered and in the filtrate the gelatin and amino-nitrogen is estimated by Kjeldahl's method. The amino-nitrogen is then estimated separately by precipitating in an aliquot part of the filtrate the gelatin by means of tannic acid after the addition of a few drops of acetic acid, filtering and examining the filtrate by Kjeldahl's method.

As factor for gelatin-nitrogen 5.61 should be used.—Chem. Ztg.; through Pharm. Weekblad, 53 (1917), 1172. (H. E.)

Arachin and Conarachin.—*Proteins of the Peanut.*—Johns and Jones have isolated two globulins from the peanut, *Arachis hypogea*, which have been named *arachin* and *conarachin*. Conarachin contains 6.55 per cent. of basic nitrogen, the highest percentage recorded for any seed protein. Arachin contains 4.96 per cent. Peanut press cake is likely to prove highly effective in supplementing food products made from cereals and other seeds whose proteins are deficient in the basic amino-acids.—J. Biol. chem.; through Pharm. J., 98 (1917), 139.

Beta-Galactosidase.—*Distribution of.*—Beta-galactosidase, the enzyme which forms and also hydrolyzes the alcohol-galactosides, occurs in almond emulsin only in very small amounts. Hoping to find a richer source of this ferment, M. Mougne has investigated a number of vegetable organs. The enzyme appears to be very widely distributed, but to occur invariably in very small quantity, less even than is found in the mixed enzymes, the so-called "emulsin" of almonds. It has been found in the kernels of plums, apricots, cherries, the seeds of apples, the fresh leaves of cherry-laurels, aucuba, and horse-radish, and in mustard seed. It did not occur, however, in fresh kephir, nor in *Aspergillus niger*.—J. pharm. chim., 15 (1917), 339.

Enzyme Action.—*Influence of Mass Action on.*—O. Bailly discusses the law of mass action, which he states was first enunciated by Berthelot and Saint Gilles in 1862. He takes the figures published by Bourquelot and Veidon in their paper on the synthesis of betamethyl glucoside and shows that the observed figures as to enzyme action agree closely with his calculations of the same reaction based upon the mass action equation.—J. pharm. chim., 16 (1917), 161.

Enzymes.—*Preparation of Sterile Solutions of.*—In a German patent granted to S. Fränkel it is claimed that sterile enzyme solutions can be obtained by adding to the solution 1 per cent. hexamethylenetetramine by which the micro-organisms are killed while the enzymes are not attacked. By this process, sterile solutions can be obtained of trypsin, papayotin, lipase both from the

pancreatic juice and from castor bean, pancreas diastase, maltose and various enzymes derived from fungi.—Chem. Ztg. Uebersicht; through Pharm. Weekblad, 54 (1917), 690. (H. E.)

Enzymes and Bacteria.—*Action of Some Poisons on.*—M. Jacoby finds that urease rendered inactive by the minutest amount of mercuric chloride. The ferment thus inactivated can be restored to activity by treatment with potassium cyanide. A relatively large dose of this salt is requisite to diminish the activity of urease; medium quantities cause a distinct, but not very great, increase of action. Nickel oxide, although insoluble in water, renders urease inactive. After filtering out the oxide the inactive ferment may be restored to activity by the addition of potassium cyanide. Urease rendered inactive by mercuric chloride cannot be restored to activity by glyocoll, but the ferment inactivated by nickel oxide is restored to activity by treatment with that substance. The decomposition of urea by bacteria is stopped both by mercuric chloride and by potassium cyanide, and neither exerts any stimulating action in small doses. Bacteria rendered inactive by corrosive sublimate are not restored to activity by treatment with potassium cyanide. It requires larger doses of sublimate, nickel oxide, and potassium cyanide to kill bacteria than to arrest the action of the ferment. Bacteria which act on urea do not also decompose methylurea, thiourea, or acetamide. It appears, therefore, that there are two types of toxic action. In one the ferment is killed, in the other the fermentative action is merely inhibited.—Biochem. Z.; through Pharm. J., 98 (1917), 257.

Gelatin and Protoplasma.—*Similarity in Behavior.*—W. O. Fenn finds that a solution of gelatin is rendered alkaline (*i. e.*, given a negative electric charge) by the addition of sodium hydroxide; sodium chloride, calcium chloride or mixtures of the two, are added in increasing proportions to a series of tubes of gelatin solution. The contents of each tube are then titrated with 95 per cent. alcohol, until an opaque precipitate is produced. Taking as the measurement the reduction in alcohol required for precipitation, results are obtained which are closely analogous to those of Osterhout on the reduction in the electrical resistance of the protoplasm of *Laminaria* when treated with the pure salts or mixtures.—Proc. Am. Nat. Acad. Sci.; through Pharm. J., 98 (1917), 337.

Invertin.—*Activity Affected by Glycerin.*—Bourquelot finds that excess of glycerin prevents the formation of the combination of glycerin and saccharose under the catalytic influence of invertin. The reaction which is complete in 7 days when extra glycerin is absent, takes 27 days when carried on in 10 per cent. glycerin solution.—Compt. rend.; through J. pharm. chim., 16 (1917), 351.

Kafarin.—*A Protein from Sorghum.*—Johns and Brewster have isolated this substance from the seeds of *Andropogon sorghum*, known as "kafir" seeds. Kafarin resembles zein in its ultimate composition, but has distinct physical properties. It contains tryptophan and, apparently, lysin, both of which are absent from zein.—J. Biol. Chem.; through Pharm. J., 98 (1917), 109.

Luciferin.—*Biophotogenesis with.*—After describing the work of N. Henry on the oxidase, luciferase, and on light-producing substance, luciferin, and after explaining Henry's imitation of such light production by the use of a mixture of pyrogallol and solution of hydrogen dioxide (in place of luciferin) and the enzymes from potato juice, R. Dubois objects to Henry's suggestion to change the names of luciferin and luciferase to photophelin and photogenin, respectively.—Compt. rend.; through J. pharm. chim., 16 (1917), 184.

Meat.—*Toxicity of Some Enzyme Hydrolysis Products.*—A. Berthelot examined a commercial meat preparation consisting of a mixture of amino acids obtained by the complete digestion of flesh in the presence of volatile antiseptics, and which was recommended for rectal administration. This was compared with a pancreatic meat "peptone," prepared rapidly without antiseptic precautions. Neutral 4 : 100 solutions, practically isotonic, and approximately of the same total nitrogen content, of these two products were injected in doses of 4 mils into guinea pigs. The amino-acid mixture killed the animals almost instantly. The pancreatic peptone solution was harmless, even in large doses. An alcoholic extract of each of the above preparations was then prepared. This was extracted, first from faintly acid, then from alkaline, solution, with ether-alcohol. The ether-alcohol residues, dissolved in water, neutralized, and diluted to 50 mils with 0.9 : 100 sodium chloride solution was also administered. Neither solution had a hemolytic

action; but a 4-mil dose of the amino-acid mixture killed a guinea-pig in a few moments. The corresponding extract from the pancreatic peptone was again innocuous. It is important that the toxic nature of these meat preparations containing amino acids should be widely known, since they are being recommended for rectal administration to patients who cannot tolerate alimentation in the usual manner. It is possible that the toxicity of the amino-acid mixture is due to the action of endocellular enzymes liberated from the bacteria killed by the antiseptics used in the process of preparation.—Compt. rend. soc. biol.; through Pharm. J., 98 (1917), 189.

Pepsin.—*Rennetic Properties of.*—Howard T. Graber finds that the substance which gives the rennetic property to pepsin is not the same as that of calf rennin. Pepsin must be activated by means of acid before it shows its rennetic power in the proper degree. Pepsin acts best on very ripe milk, even to an acidity of 0.2 per cent., while rennin is not favored by such high acid concentration. It is probable that the milk curdling and protein hydrolyzing properties of pepsin are contained in a single molecule, and that under the proper conditions of temperature and acid concentration either property will become dominant.—J. Ind. Eng. Chem., 9 (1917), 1125. (G. D. B.)

Peptides.—*Synthesis in the Animal Organism.*—Pauly obtained a small amount of hippuric acid by oxidizing a mixture of neutral aqueous solutions of benzaldehyde and glycine at the ordinary temperature with potassium permanganate. He suggests, therefore, that in the animal organism the combination of amino acids to peptides and eventually proteins, occurs by a succession of reductions and oxidations, pointing out that an amino acid is readily reduced to an aldehyde and that if combination then takes place with another amino acid, the resulting compound should yield a peptide on oxidation.—Z. physiol. chem., 99 (1917), 161; through J. Chem. Soc. Abs. (A. V.)

Peptone.—*In Bronchial Asthma.*—Adverting to his view as to the nature of bronchial asthma propounded in a lecture in 1908, which was to the effect that the asthmatic attack is a reaction on the part of the lungs to a toxic substance, "either of distinctly pathological origin, or else a product of normal metabolism which

gradually accumulates in the blood," Dr. Auld states that subsequent research had fully demonstrated the anaphylactic nature of bronchial asthma, though the particular protein substance responsible for the paroxysms is still unknown. In applying these and other considerations to the condition of bronchial asthma it was necessary to select a substance for the purpose of immunizing, which, if it did not contain the actual anaphylactic protein poison, nevertheless might contain one nearly akin to it, and this condition appeared to be fulfilled by peptone. Dr. Auld uses subcutaneous injections of peptone (Armour) $\frac{1}{3}$ Gm. in about 5 mls distilled water at blood heat, injected at an interval of three or four days during the first week. The next week two injections each of $\frac{2}{3}$ Gm. are similarly given, and in the third week two injections of 1 Gm. in 7 to 10 mls water. In certain cases this may be sufficient. Severer cases may require 1 Gm. weekly or bi-weekly. In the limited number of cases tried the results have surpassed expectation. Sometimes the effect is very rapid, the patient experiencing relief after one injection. Where attacks of great severity occurred every two or three months a few weeks' treatment beforehand has caused the attack to abort.—Brit. Med. J.; through Pharm. J., 98 (1917), 409.

Peroxidases.—*Made of Action.*—G. B. Reed finds that hydrogen dioxide recharges with oxygen colloidal platinum or plant peroxides as soon as any of the oxygen is removed by a reducing agent. In the plant, oxygen may be supplied from oxygenases or other highly oxygenated substances, and such oxygen combines with the peroxidase to form a more energetic oxidizing agent than the original source of the oxygen. It has been shown recently that in the fermentation of urea by the soya-bean urease, there is a combination between urea and ferment which eventually splits to form carbon dioxide and ammonia. It seems possible that it may prove to be generally true that the catalyzer combines in a definite manner with the reacting substance.—Botan. Gaz.; through Pharm. J., 98 (1917), 337.

Protein Foodstuff.—*Manufacture in Germany.*—Hayduck states that a new method for the production of nitrogenous foodstuff for farm stock has been devised by Delbrueck. Solutions of ammonium sulphate and sugar are fermented in open vats by means of

yeast, a resembling ordinary brewers' yeast, but more active and intense in growth. Formation of protein occurs in a few hours. It is said that 100 Lbs. of sugar will furnish by this process 76 Lbs. of food material containing 50 per cent. of protein which is well adapted for live stock. Feeding experiments with cows and pigs have given good results. The process is very simple and requires very little plant. It is recommended that factories for the production of this protein may be annexed to sugar and starch works providing waste liquors contain not less than 0.75 per cent. of sugar. Such a factory would turn out 40,000 tons of moist or 10,000 tons of dry fodder per annum. The cost price of the dry protein food is calculated at between twelve and thirteen shillings a hundredweight.—Deutsch. Zuckerind.; through Pharm. J., 98 (1917), 189.

Trypsin.—*Use of Its Preparations.*—J. H. Long calls attention to the inferiority of commercial trypsin as compared with the quality of pepsin produced by many manufacturers. He believes that the Pharmacopœia could do much to improve the quality of trypsin if it were to require a more stringent proteolytic test for pancreatin and a good milk-peptonizing test that could not be met by a superficial alteration of the casein.

The low activity of these pancreatins gives the right to question their value even though knowledge of the actual concentration of pancreas enzymes is limited.

Laboratory investigation has led Dr. Long to draw several conclusions concerning the importance of the method of administration. Digestion with free hydrochloric acid, from 0.2 to 0.3 per cent. strong, at body temperature for one hour, weakens the trypsin very little but acid and pepsin together have a marked weakening action. Still more important, the action of pepsin and acid on trypsin in the presence of a sufficient amount of protein is so nearly negligible that a large part of the trypsin may be so little weakened that it is capable of further action.

The power that protein has of holding either acid or alkali explains this behavior. A gramme of egg albumin or meat protein will hold 60 milligrammes more of hydrochloric acid in amino acid salt combination. A certain concentration of hydrochloric acid is necessary for activation of the pepsin, without which protein is not digested nor trypsin destroyed by the combination.

From this it seems likely that trypsin administered by the mouth might persist until it reached the duodenum, under limited conditions where the proper balance existed between the acid and the protein of the food. Should this nice balance not exist, much of the trypsin as well as the amylopsin would be destroyed.

In view of these facts, the formulas of the N. F. III appear irrational and the American Medical Association was justified in condemning such mixtures in spite of their being extensively prescribed. The criticisms as to smallness of dosage is also warranted, since large doses must be given so carefully to insure reasonable expectation of good results.—J. Am. Pharm. Assoc., 6 (1917), 804. (Z. M. C.)

Urease.—*Production from Bacteria.*—Jacoby found that the formation of urease by bacteria was greatly stimulated in the presence of dextrose, *d*-galactose, glycerol, glyceraldehyde, dihydroxyacetone, pyruvic and lactic acids; slightly stimulated by *d*-levulose, *d*- and *l*-arabinose, and not stimulated by mannose, *d*-sorbose, rhamnose, heptose, polysaccharides, glucosides and sugar alcohols. He also reports that the active contribution of *d*-glucose, *d*-galactose, *d*- and *l*-arabinose to the formation by bacteria of urease and the inactivity of *d*-mannose and rhamnose are due to different configuration of the sugar molecules. As a result of further experiments he obtained the ferment also, when the bacteria were grown on media containing only simple chemical substances. Lucine was found not necessary for growth of the bacteria, but for the production of urease, which was especially satisfactory, when also glycerol and sodium aspartate, or ammonium lactate and sodium aspartate were added.

Lucine is considered necessary for the formation of urease but does not affect its activity.

Jacoby dried urea bacteria, removed from agar cultures, on porous porcelain and found that the preparation containing urease could be preserved for a long time and was active in the presence of toluene.—Biochem. Z., 79 (1917), 35; 81 (1917), 332; 83 (1917), 74 and 84 (1917), 354 and 358; through J. Chem. Soc. Abs. (A. V.)

Yeast.—*Oxidative Action*—Faerber, contrary to Herzog's findings, could not find that saligenin is oxidized to salicylic acid nor that thymol and cymol are chemically changed by yeast.—Biochem. Z., 78 (1917), 294. (A. V.)

SERA AND VACCINES.

Adaptation and Disease.—In his Croonian lectures, Col. J. G. Adami discusses the intricate problem of adaptation in bacteria and the resultant evolution of disease. He dismisses as incredible the assumption that extant, or even some extinct, diseases, such as "sweating sickness," have existed from the beginning of terrestrial human history, the evidence being that diphtheria, cholera, and syphilis are of comparatively modern origin. Syphilis was certainly non-existent in early Egypt or in the Rome of the time of Galen. It is probable that diseases primarily endemic in nature and scope were diffused widely over the world by the opening of trade routes. All the available facts and considerations point to variability and adaptation, and not to the fixity of species of bacteria. Pathogenic microbes do not form an order by themselves, but, on the contrary, are singularly diverse in their affiliations. With scarce an exception, every genus of micro-organism has its representatives among the pathogenic microbes, or, conversely, every pathogenic microbe has closely related forms differing from it in little save the fact that one is virulent, growing in or upon the tissues, the other non-virulent. There is evidence to show that in the bacteria at least what are usually set down as mutations, or chance variations, are in fact imposed variations due to specific modifications of the environment, and the inference is that, within certain limits, there is direct equilibration between the organism and its environment. As an example of variation by loss of factors, there is the crucial experiment devised by Pasteur, which demonstrates that by exposing any culture of the anthrax bacillus over a given period to a given temperature of growth, with absolute precision, the power of spore production is lost, and when subsequently this modified strain is grown under ordinary conditions, through thousands of generations, there is no recurrence of spore production. It would seem, therefore, that the origin of infections is due to the transformation, by environmental or other causes, of non-pathogenic, non-virulent microbes into pathogenic and highly virulent varieties.—Pharm. J., 99 (1917), 125.

Antimeningococcus Serum.—*Standardization of.*—H. L. Amoss of the Rockefeller Institute for Medical Research, holds that the commercial producer of biologic products cannot be left to determine his own method of manufacture and his own

standards of potency, but that the federal government should provide standards for meningococcus serum. He reports on the efficiency of the serum as obtained from non-commercial (two specimens from health boards and one from the Rockefeller institute) and five obtained from commercial firms and finds the latter less potent and, in one case, unfit for use. Amoss proposes the following requirements for antimeningococcus serum: it should be suitably preserved and marketed in white glass bottles (to permit inspection) and wrapped in blue paper to exclude the actinic rays of light; and the agglutination titre for each of the four type cultures of meningococcus should be from 1 in 400 to 1 in 1000 as determined by the macroscopic method after incubation at 55° C. for 16 hours.—J. Am. Med. Assoc., 69 (1917), 1137. (W. A. P.)

Antimeningococcus Serum.—*In Epidemic Meningitis.*—As the result of a critical study of 1,300 cases of meningitis treated with the serum supplied by the Rockefeller Institute, Simon Flexner believes that the antimeningococcic serum when used by the subdural method of administration in suitable doses, and at proper intervals, is capable of reducing the period of illness; of preventing, in large measure, the chronic lesions and types of the infection; of bringing about complete restoration to health, in all but a very small number of the recovered, thus lessening the serious, deforming and permanent consequences of meningitis, and of greatly diminishing the fatalities due to the disease. He cautions that these results are dependent on properly made and controlled serums.—J. Am. Med. Assoc., 69 (1917), 817. (W. A. P.)

Antimeningitis Serum.—*Tricresol and Chloroform as a Preservatives.*—The bactericidal action of tricresol on possible contaminating bacteria is stated by Josephine B. Neal, and Harry L. Abramson, to be much superior to that of chloroform. When tricresol is not used, the pain of injecting the serum is so great as to constitute a serious drawback in the treatment of meningitis on account of the resulting objection on the part of the patient and the family, but also on account of the difficulty of regulating the dosage when the patient is struggling.—J. Am. Med. Assoc., 68 (1917), 1035. (W. A. P.)

Bacterial Vaccine Therapy.—James P. Leake, of the U. S. Public Health Service, discusses the present status of vaccine

therapy. He points out that after ten years of extensive trial of vaccine therapy, doubt has been cast on the principles on which the use of vaccine is based. He distinguishes between the prophylactic action (which is demonstrated for typhoid fever) and the curative effects, the question of non-specific reaction and the limitations of specificity are discussed, as is also the limitation of the term "vaccine" to preparations containing living or dead micro-organisms, the superiority of autogenous over stock vaccine. Leake explains why the mass of clinical reports in favor of vaccine therapy are not trustworthy and why the carefully controlled studies of Captain Whittington of the Royal Army Medical Corps, with the use of typhoid vaccine, the experiments with pertussis vaccine by Park of the New York City Health Department and the extensive study by Frank Billings are far more reliable. While controlled studies almost invariably indicate the lack of value of vaccine therapy, Leake does not condemn the use of vaccine altogether, but asks only that definite evidence for their value be produced.—J. Am. Med. Assoc., 69 (1917), 631. (W. A. P.)

Biological Products.—*From the Point of View of the Pharmacist.*
—L. E. Sayre calls attention to the rapid evolution of pharmacy from the crude drug stage of a few generations ago through the elixir period and the organic-synthetic period into the present or "biological" period.

The 1900 Pharmacopœial convention practically prohibited the introduction of remedial agents that had to be standardized by biological methods. Now, several are recognized and many valuable biological and clinical tests and reagents find a place in the U. S. P.

In spite of extensive literature, pharmacists are not as well informed as they should be. Manufacturing houses have published much valuable data but they do not supply a systematic course. A few colleges have required courses and some others have optional ones, but as soon as possible all should be required. The second edition of the Syllabus simply mentions antitoxins and vaccines in the paragraph on "Animal Drugs," but when again revised the place of this subject in a standard curriculum should be acknowledged.

The chief concern of the pharmacist is in dispensing these products and that involves, among other things, knowledge of how they

should be stored. The rapid deterioration of vaccine virus even at room temperature while at 50° F. it remains active from 3 to 6 months and at 10° F. for 4 years illustrates the necessity of refrigeration.

Professor Sayre finds from correspondence with men having wide knowledge of biological products that they believe several more should be included in the next U. S. P.—J. Am. Pharm. Assoc., 6 (1917), 861. (Z. M. C.)

Diphtheria Antitoxin.—*Chemical Reactions of.*—Experiments carried on by Albert C. Crawford and Carlton L. Andrus, and a review of the literature by these authors, reveals no chemical proof that a separation of antitoxin and globulin can be made, although this has been suggested through the work of Banzhaf and Hurwitz and Meyer.—Am. J. Pharm., 89 (1917), 158. (R. P. F.)

Luetin Test.—Confirmatory of previous investigations, H. N. Cole and H. V. Parysek find that some non-syphilitics respond positively to the luetin test and that in those non-syphilitics who do not respond spontaneously the reaction can generally be provoked by iodides. They also demonstrated that sodium, potassium or calcium bromides or iodides may provoke the test.—J. Am. Med. Assoc., 68 (1917), 1089. (W. A. P.)

The Mastiche Test.—S. L. Immerman reports on the technic and significance of the mastic test. As regards the technic: A solution of gum mastic is suspended in alcohol and distilled water. This is the reagent. It is precipitated by 1.25 per cent. sodium chloride, but if a small amount of potassium carbonate is added, there is no precipitate unless protein, certain salts in certain concentration, or a pathologic spinal fluid is also added. In the test, therefore, the reagent, the spinal fluid in various dilutions, and the sodium chloride and potassium carbonate are mixed. The gum mastic reagent is a pearly, translucent fluid. With pathologic spinal fluids, or other substances which alter the mastic reagent, the following changes may occur: (1) loss of translucency without any distinct precipitate; (2) varying degrees of precipitation, without any clear, supernatant fluid; (3) large amount of precipitation, with partly or entirely clear supernatant fluid. In the tables, therefore, "clear" refers to a maximum amount of precipitation.

The author concludes that the reaction obtained does not determine if the fluid is syphilitic or non-syphilitic and it is not equivalent with or supplemental to the colloidal gold reaction and that, as a clinical test, the information obtained can be obtained by much simpler means.—J. Am. Med. Assoc., 69 (1917), 2027. (W. A. P.)

Serums and Vaccines.—*Standardization of.*—The misunderstandings and difficulties as regards the standardization of serums and vaccines are pointed out by G. W. McCoy, Director of the U. S. Hygienic Laboratory. So far, legal standards have been formulated only for diphtheria and tetanus antitoxin. A tentative standard for antityphoid vaccine has been devised. This completes the list of standardized biologic products. Though not standardizable, vaccine virus and antirabic virus are tested for potency in the process of manufacture. McCoy reviews the work which has been done in the attempt to work out and standardize other biologic products, and brings out the many difficulties which are in the way.—J. Am. Med. Assoc., 69 (1917), 378. (W. A. P.)

Serum for Gas Gangrene.—This serum has been developed through the researches of Dr. Carroll G. Biell and Miss Ida Pritchett. The Rockefeller Institute for Medical Research has undertaken to supply the Allied armies with this serum believed to be an effective antitoxin for the gas bacillus producing gangrene.—Sc. Am., Nov. 3, 1917, 325. (O. R.)

Tuberculins.—L. K. Darbaker in a paper read before the Pittsburgh Branch describes in detail the organisms which cause tuberculosis. He then reviews what has been done to overcome the disease. The various tuberculins are described together with their history, method of preparation and standardization. The tests and reactions used in detecting and combating tuberculosis are also described.—J. Am. Pharm. Assoc., 6 (1917), 621 and 699. (H. H. S.)

Vaccines.—*For Skin Diseases.*—J. Danysz basing his work upon the theory that the local lesions of eczema and certain other skin diseases are caused by the action of toxins produced by intestinal bacteria, experimented with vaccines prepared from cultures of the intestinal flora in certain cases. From the intestinal contents of a patient suffering from severe acute eczema over the whole

body a broth culture gave an almost pure growth of enterococcus in long chains. From this, regrown on ordinary gelose, a very dilute vaccine was prepared, containing 50 to 100 million organisms per mil in salt solution. This was heated to 60° C. for one hour in ampuls. The patient was treated with eight injections of one mil each on successive days. The distressing itching was alleviated after the first injection, and fifteen days afterwards the patient was able to sleep without disturbance from the irritation. The local lesions were less red, and no longer exuded secretion. A fresh culture was then made from the intestinal contents, and from this a vaccine was prepared as before. Eight more injections were administered. In a month's time the patient was completely cured. Previous to this treatment the usual drugs and regimen had been prescribed in this case without benefit. Two other cases of psoriasis treated in an analogous manner, the eruption disappeared after the use of the auto-vaccine. These three cases do not justify too wide deductions, but they indicate that further investigation in this direction is desirable.—Compt. rend.; through Pharm. J., 98 (1917), 337.

Vaccine Therapy.—*Non-specific Character of.*—Joseph L. Miller discusses the literature which bears on the influence which the injection of non-specific vaccines, proteins and other bodies exerts on various infectious diseases.

Miller discusses the difficulty of determining the effects of a medicament on the course of an infectious disease and states that a study of the literature does not reveal any evidence that the subcutaneous injection of any vaccine has produced beneficial results in any of the many diseases so treated. During the last two years extensive studies have been made regarding the value of specific and non-specific vaccine therapy. There is considerable evidence that the intravenous injection of non-specific vaccines, foreign proteins or even non-protein bodies may produce a reaction, accompanied by chill, which produced a certain effect on the disease. Miller reports on the treatment of 175 cases of rheumatic arthritis treated with typhoid vaccine or other foreign protein. It is his opinion that if the toxicity of each vaccine is determined and other precautions taken, that the course of rheumatic arthritis is favorably influenced by the intravenous injection of proteins. He warns that the treatment is in the experimental stage and should and must not be used indiscriminately.—J. Am. Med. Assoc., 69 (1917), 765. (W. A. P.)

Vaccine Virus.—*Preservation.*—The U. S. Public Health Service calls attention to the fact that vaccine virus rapidly loses its potency unless kept cold. Anybody who buys vaccine virus should make sure that it has been kept in a refrigerator, and not, as is the custom in some drug stores, in a drawer back of the counter. It is best to keep it in a metal container which is in actual contact with the ice itself, as it cannot be kept too cold.—*Sc. Am.*, July 21, 1917, 39. (O. R.)

URINE, BILE, BLOOD, ETC.

Clinical Work and the Pharmacist.—C. W. Ballard points out the large field open to the pharmacist in urine analysis and similar clinical work. He feels that the course preparing for such work should include an elementary course in the anatomy, histology, physiology and pathology of the entire urinary tract. He gives some general directions in carrying out sedimentary work, with particular reference to the comparatively simple apparatus required.—*Proc. N. Y. S. Pharm. Assoc.*, 39 (1917), 215.

Clinical Laboratory.—*Collection of Material for.*—J. Atlee Dean outlines the proper method of collecting specimens, also an effort to impress the necessity of delivering material that will reveal the real conditions.

Urine.—Two fluidounces should be collected, preferably three hours after a meal. It should be placed in a clean bottle and in warm weather preserved with a little gum camphor. (Chloroform, thymol, salicylic acid and formaldehyde all have disadvantages which the author cites.) Morning urine which is commonly collected, is least likely to contain slight amounts of albumen or glucose. For bacteriological examination, specimen should be collected so as to avoid contamination with extraneous organisms. In men the glans penis should be washed with soap and water, then dilute alcohol, the first portion of urine voided should be rejected, and the last portion collected in a sterile manner. In women catheterization should be resorted to. Reported colon infection is often due to careless technic. The writer claims that carefully collected specimen of urine will reveal infections of the urinary tract, throat, heart, and joints; and a bacteriological examination may give the desired information besides furnishing the organisms for an autogenous vaccine.

Sputum.—The morning specimen should be collected in a clean wide-mouth bottle, which after corking should be washed with alcohol or phenol solution. The sputum should be raised by a pulmonary coughing act and free from the secretions from the nasopharynx.

Pus.—Cleanse surface with ether or alcohol, never with phenol or mercuric chloride, as these will kill the organisms. For microscopic examination spread on slide and allow to dry. For the preparation of an autogenous vaccine the material should be collected on a sterile swab, placed in a sterile tube and sent at once to the laboratory.

Gastric Content.—The test meal consisting of two slices of dry toast and a cup of weak tea or water should be extracted within an hour after eating.

Blood.—For Widal test, may be collected by allowing a few large drops to dry upon a piece of glazed paper.

For differential count the method described by Stitt may be followed. "Take a small drop of blood on the end of a clean slide, touch a second slide about a half inch from the end of the drop, and as soon as the blood runs out along the line of the slide-end, slide it at an angle of 45° to the other end of the horizontal slide." The blood is pulled or drawn behind the advancing edge of the advancing slide. Samples for culturing, either for vaccines or diagnosis, should be taken from one of the large veins at the flexure of the elbow. 10 mils are distributed in quantities of 3 or 5 mils into flasks containing sterile bouillon.

When desired in large quantities for Wassermann or other serum tests the following method described by Kolmer may be employed:

(1) Warm the hand by immersion in hot water, then wash the last joint of the middle finger with alcohol; before puncturing, compress the finger and squeeze in such a manner as to drive the blood toward the end of the finger. (2) Prick deeply with a broad lancet, Hagedorn needle or scalpel across the lines of the skin. (3) Collect in a small test-tube.

The writer concludes his remarks with the admonition that the laboratory worker be frequently consulted as to how he wishes specimens collected and delivered.—J. Am. Pharm. Assoc., 6 (1917), 15. (L. S.)

Urine.—*Acetone in.*—Fittipaldi describes a modification of the usual tests for acetone in the urine which, he says, elicits an exclu-

sively specific acetone reaction. It also shows up the diacetic acid, while the technic is simple, takes little time, the color reaction is durable, and the test is as sensitive as any of the current technics in vogue. He adds about 0.02 gramme of finely pulverized sodium nitroprussiate to 4 or 5 mls of urine in a 12-mil test-tube. They are mixed until the salt is entirely dissolved, and then he superposes on the urine, pouring it along the wall of the tube; 1 mil of ammonia and the whole is left untouched for fifteen minutes. There is then a colored zone between the two fluids. If this zone is yellow to chestnut color, the acetone content is within normal range. If the zone is of a more or less deep chestnut color, there are traces of acetone, but no diaceturia. If the zone is violet, there is considerable acidosis. In this case he mixes the fluid and adds acetic acid by the drop until the fluid is slightly acid. *Gaz. Osp. e. clin.*; through *Drug. Circ.*, 61 (1917), 246.

Urine.—*Assay of Acetone Bodies in.*—E. Lenk utilizes the fact that urinary substances other than acetone that react with iodine may be destroyed by warming the urine with potassium permanganate and acetic acid. After such treatment, the excess of permanganate is removed with oxalic acid, followed by treatment with alkali. Then the quantity of acetone is determined by titration with iodine V. S. If the combined acetone, diacetic acid content of the urine is desired, it is warmed with oxalic acid before treatment with permanganate, thus converting the diacetic acid into acetone.—*Biochem. Z.*; through *J. pharm. chim.*, 16 (1917), 316.

Diabetic Business.—*Methods of Securing.*—Observations showing how the druggist may obtain a remunerative business by catering to diabetic patients are given.—*Chem. and Drug.*, 89 (1917), 98. (K. S. B.)

Urine.—*Detection of Egg Albumin in.*—In a lengthy article, C. N. Peltriset discusses the problem just named. He does not consider Maurel's and the formol-acetic reagents very serviceable; he finds the Godfrin sodium chloride-acetic acid test (See *Year Book*, 1916, 416) effective, provided the amount of acetic acid be increased to 15 drops to each 25 mls of urine tested. He states

that 2 mls of acetic acid to each 10 mls of urine at ordinary temperature, will completely precipitate the ovalbumin and that a solution of five mls of concentrated nitric acid in 95 mls of alcohol will likewise precipitate the ovalbumin. Pathological albumin gives only a feeble response to these reactions and to the urine filtrated after such tests, the ordinary albumin reactions may be applied. None of these chemical tests, however, have the same sharpness as has the sero-reaction of Hollande.

The paper also discusses the difficulties in accurately distinguishing between pathological albumin and the pseudo-albumins.—*J. pharm. chim.*, 16 (1917), 257 and 299.

Urine.—*Albumin Detection by the Micromethod.*—Deiters says that the findings by this method are more distinct when a small amount of urine is used in a manner he describes. An ordinary test-tube is heated until the rounded bottom can be pushed in to make a small ball-shaped or conical depression in the lower end of the test-tube. This can be treated with six or eight drops of nitric acid and the urine poured on top as usual. The turbidity resulting is more distinct than with the ordinary technic, as more light gets to the fluid in proportion to the amount of the fluid. The findings are distinct, even at 1 : 200,000 dilution.—*Münch. med. Wochschr.*; through *Drug. Circ.*, 61 (1917), 202.

Urine.—*Albuminuria Produced by Injections of White of Egg.*—In order to discover whether a malingerer could simulate albuminuria, Hollande and Levrat gave six patients rectal injections, containing in each case the whites of six eggs, and then tested the urine voided for several hours after the injections. They found that in healthy subjects no albumin was found in the urine after such injections; that those having kidney lesions voided urine containing albumin; and that those already showing albuminuria, voided urine containing an extra amount of protein. The augmentation of albumin in the urine continued only for a day and never gave the ovalbumin reactions.—*J. pharm. chim.*, 16 (1917), 193.

Urine.—*Albumin Test.*—Aufrecht pours the urine to be tested for albumin on the surface of 10 mls of saturated sodium chloride solution acidified with a few drops of concentrated nitric acid and placed in a test-tube. As little as 0.01 gramme of albumin per

liter of urine may thus be determined, a turbid ring forming at the junction of the liquid indicating the presence of albumin. Pharm. Ztg., 62 (1917), 38; through J. Chem. Soc. Abs. (A. V.)

Urine.—*Simplest Albumin Test.*—Lenz recommends sulfo-salicylic acid, as a reagent for detecting albumin. Heat is not necessary.—Münch. med. Wochschr., 64 (1917), 1267; through J. Chem. Soc. Abs. (A. V.)

Urine.—*Detection of Egg Albumin in.*—A. C. Hollande gives a résumé of the papers he has published on this subject and then criticises the article by Godfrin (See Year Book, 1916, 416) on the same topic. Hollande considers the chemical tests, such as use of Maurel's reagent (sodium hydroxide, copper sulphate and acetic acid) and of aceto-formol reagent (equal parts of acetic acid and formaldehyde solution), as merely suggestive, since both of these reagents precipitate serum albumin as well as ovalbumin. He insists that in order to obtain a true differentiation between these two proteins, a biochemical precipitin prepared in the serum of a rabbit by injections of white of egg into the animal, must be employed.

He briefly discusses the tyndalization of the serum stored in ampuls and points out the value of the test in detecting malingerers.—J. pharm. chim., 15 (1917), 65.

Urine.—*Arsenic a Normal Constituent of.*—P. Klason has never taken arsenic in any form, nor has he suffered from arsenic sickness. Nevertheless, he finds that his urine invariably contains minute traces of arsenic, to the extent of 0.000005 Gm. to 0.0000125 Gm. per liter. It is therefore concluded that arsenic is a normal constituent of the human body. It is probably introduced with the food ingested. An improved form of apparatus and full details of the methods advocated are described. The methods hitherto used for determining small amounts of arsenic in organic matter are stated to give results so inexact as to be worthless.—Arch. Kem. Min. Geol.; through Pharm. J., 98 (1917), 337.

Urine.—*Assay of Beta-oxylbutyric Acid in.*—E. Ohlsson dissolves 100 grammes of ammonium sulphate in 200 mls of urine, adds 25 mls of 20 per cent. sulphuric acid and then 275 mls of the

filtered fluid is shaken out with an equal volume of acetic ether, which after separation is in turn shaken out with a 30 per cent. solution of sodium carbonate. The acetic ether, thus freed from the oxybutyric acid, is used to again shake out the urine and if this treatment is repeated five times, 93 per cent. of the total amount of oxybutyric acid will be extracted from the urine. The quantity of acid thus removed from the urine can be determined by a polariscopic reading of the sodium carbonate solution. For a rapid clinical test, one shaking out of the urine with acetic ether suffices. This removes about 42 per cent. of the total oxybutyric acid present in the urine.—*Biochem. Z.*; through *J. pharm. chim.*, 15 (1917), 267.

Urine.—*Detecting Bile Pigments in.*—L. de Iager gives the following two methods for detecting bile pigments in urine: The one which is a modification of Gmelin's method is carried out by adding to 5 mls of urine two drops of a 0.5 per cent. solution of sodium nitrite, and overlaying the mixture with N/5 hydrochloric acid. In the presence of gall pigments, a green ring is formed at the zone of contact of the two liquids. In order to facilitate the separation of the liquids, the urine is saturated with sodium chloride. The other method is a modification of Huppert's process; the urine being mixed with a few drops of zinc chloride, the precipitate collected on a filter and a mixture of one mil of hydrochloric acid, 9 mls of alcohol and 2 drops of a 0.5 per cent. sodium nitrite solution poured on it. The first few drops of filtrate are colored yellow, the following drops emerald-green when bile pigments are present.—*Ned. Tijdschr. v. Gen.*; through *Pharm. Weekblad*, 54 (1917), 218. (H. E.)

Urine.—*Detecting Bile Pigments in.*—Kallos shakes the urine (5–8 mls) with dilute hydrochloric acid (1–2 mls) and adds 2–3 drops of $\frac{1}{2}$ per cent. potassium or sodium nitrite solution and mentions that according to the quantity of bile pigment present a pale olive green coloration will be developed.—*Deutsch. med. Wochschr.*, 46 (1917); through *J. Chem. Soc. Abs.* (A. V.)

Urine.—*Test for Blood in.*—E. Juston Mueller describes the Meyer blood test, which is based upon the fact that when a decolorized phenolphthalein-sodium compound is brought into contact

with traces of blood and with hydrogen dioxide solution, the brilliant red color is restored. In carrying out the test 5 to 10 mls of urine are mixed with an equal volume of a solution of one part of glacial acetic acid in 49 parts of 90 per cent. alcohol, after which a few drops of the phenolphthalein reagent are added, followed by a few drops of solution of hydrogen dioxide.

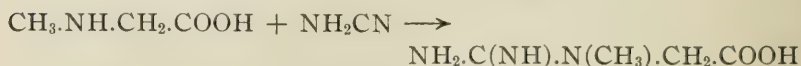
The leuco compound of phenolphthalein has been hitherto produced by reduction with zinc dust. Mueller finds that a better method of preparation is to heat together in a flask 2 grammes of phenolphthalein, 20 grammes of potassium (or sodium) hydroxide and 120 mls of distilled water. While warm, add 3 grammes of powdered sodium hydrosulphite and boil until the liquid is decolorized.—J. pharm. chim., 16 (1917), 20.

Urine.—*Test for Blood in.*—Thevenon and Rolland use a pyramidon-acetic acid mixture to detect blood in urine or other pathological material, the test being based upon the fact that pyramidon in the presence of the blood oxydases produces a violet color. Their reagent consists of two fluids, one being a solution of 2.50 grammes of pyramidon in 50 mls of 90 per cent. alcohol; the other being a mixture of 1 mil of glacial acetic acid and 2 mls of distilled water. In carrying out the test, 3 to 4 mls of urine are mixed with an equal volume of the pyramidon solution and with 6 to 8 drops of the acetic acid solution. After shaking 5 to 6 drops of hydrogen dioxide solution are added, when an intense violet is produced when blood is present. The test can be used with other pathological fluids or with an aqueous extract of fecal matter.—J. pharm. chim., 16 (1917), 18.

Urine.—*Relative Calcium and Magnesium Content.*—Nilson and Burns found on the examination of the urine of 25 healthy students that the daily output of calcium (calculated as oxide) ranges from 0.1685 to 0.1468 gramme and of magnesium (calculated as oxide) varied from 0.1912 to 0.3130 gramme. The largest daily excretion of calcium (calculated as oxide) noted was 0.4875 gramme and of magnesium (calculated as oxide) was 0.4160 gramme. The smallest daily excretion of calcium was 0.099 gramme and of magnesium was 0.1180 gramme.—J. Biol. Chem.; through J. pharm. chim., 15 (1917), 265.

Urine.—*Occurrence and Significance of Creatinine in.*—The discovery of fairly accurate methods for isolation and determination

of creatinine which is present in normal urine of the average adult male to about 0.08 per cent. is, perhaps, responsible for considerable interest in it of late. It has been isolated in crystalline form, its molecular and constitutional formulæ have been determined and it has been prepared synthetically. It is the anhydride of creatine which may be called the ureide of sarcosine, or methyl-glycocoll; or, methyl-guanidine-acetic acid. Creatine is prepared by the direct union of methyl-glycocoll and cyanamide.



Creatine readily passes over to anhydride, creatinine.

Creatinine reduces Fehling's solution and also reduces picric acid to picramic acid in an alkaline solution. Folin's colorimetric method for determination of creatinine is based on the fact that picramic acid solution is distinctly reddish.

Creatinine according to W. F. Gidley is widely distributed in the body tissues, existing in blood, brain, thyroid body and particularly in muscle, totaling 120 Gm. in the average adult. Creatinine of urine is probably derived from creatine, but where the change occurs is not known and the source of creatine, itself, is more uncertain.

Clinical data on its occurrence in pathological urine is not sufficient to make any conclusions justifiable.

When it becomes possible to distinguish with certainty between creatine and creatinine quantitatively, then the solution of other problems will become possible, problems that may be of much value.—J. Am. Pharm. Assoc., 6 (1917), 1045. (Z. M. C.)

Urine.—*Color after the Administration of Cryogenin.*—L. Grimbert discusses the paper of the title just given by Gallois and Monchel (See Year Book, 1916, 417) and points out that the test suggested by them is of little value in alkaline urine, which is usually colored a deep yellow.

If, on the other hand, the urine is clarified with lead acetate and then acidulated with sulphuric acid and the filtrate then shaken with ether, the ethereal layer will hold the cryogenin and if the colorless ethereal solution be separated and shaken out with ammonia water, the ammoniacal layer will show the characteristic cryogenin yellow.—J. pharm. chim., 15 (1917), 307.

Urine.—*Detection of Cryogenin in.*—E. Justin-Mueller discussing the foregoing article states that he has found the best way to detect cryogenin in the urine is by the use of Denigé's reagent (solution of mercuric acetate).

Justin Mueller places 10 mls of urine in a test tube, then adds ten mls of distilled water and then a few drops of a 20 per cent. solution of mercuric acetate. If cryogenin is present, a characteristic salmon colored precipitate is formed.—J. pharm. chim., 16 (1917), 52.

Urine.—*Detection of Emetine in.*—M. François describes the work of his pupil, Dr. Million, on the extraction and identification of emetine in urine. Million finds that when the urine is clarified with lead acetate and the excess of lead is removed by addition of sodium sulphate, the alkaloid in the filtered clarified urine can be easily shaken out with chloroform or with a mixture of ether and chloroform, after the urine has been rendered faintly alkaline by addition of ammonia. The article gives the general and special reagents used for the identification of the separated emetine. For Mayer's and Bouchardat's reagent only 0.01 to 0.1 milligramme of emetine is required; for the special emetine reactions (potassium permanganate and sulphuric acid, or ammonia molybdate and sulphuric acid), at least 0.5 milligramme is required.—J. pharm. chim., 16 (1917), 211.

Urine.—*Report on Sample Containing Glucose, Maltose and Dextrine.*—Gaillard and Fabre report on urine voided by a patient suffering from shell shock which showed in first sample 50 grammes of glucose per liter as shown by reduction tests, and 340 grammes of glucose per liter as shown by its optical rotation. This naturally indicated the presence of optically active material other than glucose and a closer study of the sample showed the presence (in one liter) of 36 to 37 grammes of dextrine, 25 to 26 grammes of glucose and 35 to 36 grammes of maltose. Eight other samples of the urine of the same patient were examined during six months, the last sample showing 36.7 grammes of glucose per liter by reduction tests and 80.2 grammes of glucose per liter by optical rotation tests. The article gives details of manipulation in separation of the three carbohydrates found and sounds a warning that all samples of urine showing marked discrepancies in glucose content by reduction and by optical tests should be examined for other non-reducible carbohydrates.—J. pharm. chim., 16 (1917), 129.

Urine.—*Determination of Glucose.*—P. J. Cammidge describes a modification of Scales' volumetric method in which he substitutes for Fehling's solution a modified Benedict solution, as follows: Sodium citrate, 200 Gm.; anhydrous sodium carbonate, 100 Gm. (or 200 Gm. crystallized sodium carbonate); sodium bicarbonate, 10 Gm. Dissolve in about 600 mls of distilled water by the aid of heat, and add to the solution, with constant stirring, crystallized copper sulphate dissolved in about 150 mls distilled water. When the mixed solutions have cooled to about the room temperature, the volume is made up to 1000 mls. This solution is about ten times as sensitive as Fehling's solution, and the test is applied thus: 5 mls of the solution are placed in a clean test-tube, and eight drops, not more, of the urine added, and the contents of the tube boiled, preferably in a boiling water-bath for five minutes. After boiling, the tube is set aside for two minutes to allow subsidence. If there is only a small amount of sugar, under 0.1 per cent., or the reducing substance is chiefly pseudo-levulose, a light green opacity forms. A more bulky green precipitate present when the tube is taken out of the boiling water indicates about 0.1 to 0.5 per cent. A dense yellow precipitate suggests about 0.5 to 2.0 per cent., and a thick red precipitate points to there being over 2.0 per cent. of sugar. Details for the quantitative estimation of sugar in the urine and blood will be found in the article cited. The author states that the procedure described has been in daily use in his laboratory for over a year, and has proved to be reliable and economical of time and material as compared with methods previously employed. The modified Benedict solution, which keeps indefinitely unchanged, avoids most of the fallacies of Fehling's solution, and may be employed for both qualitative and quantitative work.—*Lancet*; through *Pharm. J.*, 98 (1917), 365.

Urine.—*Benedict's Test for Glucose.*—P. J. Cammidge points out that by an omission from the preceding article of the statement that the solution was for quantitative work, medical men have complained to him that they have been misled, and therefore have not got satisfactory results. Benedict's *qualitative* solution, employed in testing for sugar, is prepared as follows: With the aid of heat, dissolve 173 Gm. of sodium (or potassium) citrate and 100 Gm. of anhydrous (or 200 Gm. crystallized) sodium carbonate in about 700 mls of distilled water. Dissolve 17.3 Gm. of pure crystallized copper sulphate in about 100 mls of water. Cool the

solutions to room temperature, pour the second into the first slowly, and, with constant stirring, make up to 1000 mls with distilled water. The difficulties of having two separate solutions for quantitative and qualitative work may be avoided by employing the modified Benedict solution and methods of estimating sugar in the urine and blood described by Dr. Cammidge above.—*Lancet*; through *Pharm. J.*, 99 (1917), 125.

Urine.—*Glucose Assay of.*—E. Lopez describes the cupric cyanimetric assay of reducing sugars. The sample of urine is heated with a known excess of mixed Fehling's solution and after complete separation of the cuprous oxide, the mixture is filtered and the residual copper in the filtrate is then determined by titration with a 5 per cent. solution of potassium cyanide which has been standardized against the Fehling copper solution. As a control the amount of precipitated cuprous oxide can be determined by any of the standard methods.—*Am. Soc. espan. fisica quim.*; through *J. pharm. chim.*, 16 (1917), 218.

Urine.—*Glucose Assay of.*—G. C. Parnell restates, with some modification, his procedure for the application of this test. By boiling, for not more than eight or ten seconds, equal volumes of liquor potassæ and diabetic urine (previously proved to be such by Fehling's solution), constant colors are produced, corresponding to the amount of glucose present. By treating in the same manner normal urines, to which accurately known quantities of glucose are added, constant colors are also produced, by which a standard can be obtained for comparison. For practical and portable purposes, a set of four tinted glasses, the size of microscopic slides are used. The glasses have labels attached showing the percentage of glucose to which the colors correspond, the number of grains per ounce, and parts per thousand. Compared with the gravimetric method, in which the precipitated cuprous oxide is oxidized and weighed as cupric oxide, the late Dr. Mouillot found that the results obtained by the two methods approximated very closely, the mean error over the whole series, as regards the colorimetric method, being only 0.19 per cent.—*Brit. Med. J.*; through *Pharm. J. Supp.*, July 7, 1917, 19.

Urine.—*Formation of Indigoid Pigments in.*—E. Justin-Mueller discusses at considerable length, the formation of indigoid pig-

ments, hemi-indigotin, indigotin, indirubin and isatin in the urine. He believes that the change in shades of the extracts of indigoid pigments, noted by previous investigators is to be attributed largely to the differences in solubility of these pigments. He finds ethyl ether is a good "shaking out" solvent for the pigments, despite the statements in reference works that they are insoluble in that solvent. Dry indigotin may not dissolve in ether, but indigotin in fine division in urine will dissolve in ether. Finally he suggests a colorimetric assay of indigoid pigments in urine by comparison of the chloroformic extract against a standard aqueous solution of indigo carmine.—*J. pharm. chim.*, 15 (1917), 249.

Urine.—*Detection of Indigo Red in.*—DeJager reports that in a specimen of urine sent for examination which contained albumin and, supposedly, blood, as it was reddish, no red corpuscles could be detected in the sediment and the reaction was alkaline. The guaiac and benzidin tests for blood gave negative findings, and other tests proved the coloring matter to be indigo-red. The author thinks it liable that this has sometimes been mistaken for blood.—*Nederl. Tijdsch. Geesk.*; through *Drug. Circ.*, 61 (1917), 127.

Urine.—*Iodine from.*—Patients who are treated with iodine compounds excrete practically all the iodine through the urine. M. de Iony suggests to recover the halogen by treating the urine with sodium bisulphite, copper sulphate and sulphuric acid, thus converting the iodine into cuprous iodide from which the pure halogen can easily be obtained in the usual way. De Iony found that more than 25 per cent. of the iodine taken can be recovered.—*Pharm. Weekblad*, 54 (1917), 77. (H. E.)

Urine.—*Destruction of Organic Matter in.*—L. Cordier reviews the various methods destruction of organic matter in urine. He finds the Moreigne method of fusion of the urine residue with a mixture of equal parts of potassium nitrate, potassium carbonate and sodium carbonate is the most effectual, but notes that it has the objection of being very wearing on the dish employed. Experimentation has shown him that magnesium nitrate is an equally effective fusing agent without seriously affecting porcelain vessels. He mixes 20 mls of urine and 2 grammes of potassium nitrate in a 125-mil porcelain dish, evaporates to dryness and then incinerates in the usual way.—*J. pharm. chim.*, 16 (1917), 363.

Urine.—*Assay of Oxidizable Material in.*—Richet and Cardot assay urine for oxidizable material other than urea by a so-called *manganic index*. The method consists of adding to 12 test-tubes each containing 10 mls of a solution containing 0.632 gramme of potassium permanganate and 30 mls of sulphuric acid to the liter, 0.5, 0.6, 0.7, etc., mls of urine diluted one in ten. After 24 hours the degree of reduction of the permanganate is noted, the smallest amount of urine, that decolorizes the permanganate being taken as the basis of calculation. The volume of permanganate solution reduced by a liter of urine is the manganic index and this in a healthy person varies from 50 to 250.—Compt. rend.; through J. pharm. chim., 16 (1917), 251.

Urine.—*The Phenol Sulphonephthalein Excretion Test.*—It has been assumed that excretion of less than 60 to 80 per cent. of phenolsulphonephthalein in two hours is an indication of renal insufficiency. It has been found, however, that in certain experimental conditions, phenolsulphonephthalein may be destroyed in the body and therefore not appear in the urine although the kidneys function normally. If this condition is found to occur in clinical cases the interpretation of the tests may have to be limited to this: an excretion of 60 to 80 per cent., *i. e.*, a positive result, within two hours after the injection of the phenolsulphonephthalein is evidence of satisfactory renal activity.—J. Am. Med. Assoc., 68 (1917), 379. (W. A. P.)

Urine.—*Identification of Picrates in.*—H. Pecker gives a summary of a paper published by him in the Archives de Médecine et de pharmacie militaires. He disagrees with the statement of Baral that the urine of those malingers, who take picric acid to simulate jaundice, contains picramic acid rather than picric acid; as his own experience as pharmacist major in the army laboratory shows that the amount of picric acid excreted in such cases is greater than the amount of picramic acid.

For mixtures of picric and picramic acid he prefers the "*sulfate ferreux tartrique*" reagent of A. Le Mitouard, which he calls throughout the paper, the "S. F. T. reagent." In using this reagent, a small amount of ammonia water is added to the urine, which is then layered on the reagent, a characteristic cherry-red ring of diamidonitrophenolate of ammonium, being produced when picric compounds are present. He finds the test is sensitive even in

dilutions of 1 to 2 milligrammes in a liter. He tests urine quantitatively by diluting the sample until the reaction is no longer given.

The test can be applied directly to urine, to an ethereal extract of the urine or by applying to a cloth dipped into the ethereal extract. Clarification of the urine by use of barium chloride or lead acetate is not advisable, as considerable amounts of the picric compounds will be thrown out with the precipitate.

The diazo reaction is a sensitive test for picramates but not for picrates. By means of it, 0.05 milligramme of picramic acid can be detected in a liter of urine. In carrying out the test 15 to 20 mls of urine are placed in a test-tube, and to it are added 2 drops of a 1 per cent. solution of sodium nitrite, 5 drops of 50 per cent. sulphuric acid and a fragment of litmus paper. To this is added enough fresh solution of betanaphthol in ammonia water, sp. gr. 0.925 to turn the litmus paper blue. When picramates are present the urine will be colored a reddish violet and on shaking with ether, the ethereal layer will be colored rose-red to violet, according to the amount of picramates present.—J. pharm. chim., 15 (1917), 20.

Urinary Sediments.—*Staining of.*—Ten mls of urine are mixed with 3 drops of an aqueous 5 per cent. aniline blue solution and 6 to 8 drops of a 2.5 per cent. solution of eosin in glycerin to which 5 per cent. of liquified phenol has been added. The mixture is then centrifuged and the sediments examined microscopically. H. Lipp-Weingarten found that by this method leucocytes, epithelial cells, casts, etc., each acquire a different color.—Südd. Apoth. Ztg.; through Pharm. Weekblad, 54 (1917), 417. (H. E.)

Urine.—*Determination of Sulpho-ethers in.*—L. Cordier discusses the assays for sulphates and sulpho-ethers in urine, as published by Salkowski, by Desmoulière and by Gauvin. He finds the latter method—determination of total sulphates in a sample hydrolyzed with hydrochloric acid, determination of metallic sulphates in the unhydrolyzed urine and calculation of the sulpho-ethers by difference—gives exact results. He finds that for the hydrolysis, boiling for 15 minutes is sufficient.—J. pharm. chim., 16 (1917), 360.

Urine.—*Trinitrotoluene in.*—B. Moore finds that when trinitrotoluol has been absorbed, it is excreted in the urine in combination;

it cannot be removed by shaking out with ether until it has been liberated from this combination by treatment with acid. On the other hand, when its presence therein is due to accidental contamination, either from the clothes or the person of the worker, being in the free state, it is easily removed by shaking out, without preliminary treatment with acid. It is, therefore, easy to determine if any T. N. T. found has been absorbed or not. To detect it, Webster's test is applied as follows: Twelve and a half mls of the urine are mixed with an equal volume of sulphuric acid 20 : 100, and shaken out with 10 mls of ether. The acid aqueous liquid is rejected, and the ether is washed once with 25 mls of water. It is then treated in a test-tube with 5 mls of alcoholic potash solution, 4 or 5 : 100. When T. N. T. is present, a purple color is at once developed, varying in intensity with the amount. As the test is fugitive, it has been impossible to give a more precise descriptive scale of this than "trace, 1, 2, 3, 4, and intense." With T. N. T. workers the reaction will be obtained in varying intensity from a large number of cases after a spell of work. But it will usually disappear before work is resumed on the ensuing shift. These cases are not in immediate danger of intoxication. When, however, the urine of a worker continues to give the reaction after removal from the work and from T. N. T. soiled clothing for three or four days, the case is certainly one susceptible to absorption, and should be removed from T. N. T. work. Care must be taken to distinguish between the reaction of absorbed T. N. T. and that due to accidental contamination. In the latter case, the violet color will be afforded by the urine directly by the above test without any preliminary acidification. This detection of contamination, however, is in itself useful, since it indicates that the prescribed precautionary regulations are not being observed. After removing this free T. N. T. by shaking out with ether, the urine may be acidified and again shaken out to remove the combined and absorbed T. N. T.—Med. Press; through Pharm. J., 98 (1917), 9.

Urine.—*Uroerythrin, a Pigment in.*—V. Borrien states that the pigment, invariably present in urines which contain an excess of uric acid, and which is responsible for the pink or red sediments and the so-called "cayenne pepper" deposits in these, has a great affinity for any suspended matter in the urine. Advantage is taken of this for its extraction. The fresh urine, previously strained to remove suspended matter, is shaken up with powdered talc.

When this subsides, it carries down the uroerythrin in a state of adsorption. The supernatant liquid is decanted, the precipitate collected and quickly washed with water. As the pigment is very sensitive to light, its manipulations must be quickly conducted, preferably in the dark. The red colored talc is then extracted with alcohol 95 per cent. containing 0.5 per cent. of hydrochloric acid. This removes the whole of the pigment when warmed in the water-bath to 40° to 50° C. If exposed to light, the alcoholic solution is decolorized quickly, but less rapidly in the presence of hydrochloric acid than in simple alcoholic solution. When the alcoholic solution is gently evaporated it leaves a brick-red amorphous residue, but this does not give the reactions of the original uroerythrin. Uroerythrin is precipitated from its alcoholic solution by adding a large volume of water; and it may then be shaken out with amyl alcohol or acetic ether. The pigment may be extracted in a greater state of purity from the red deposits than from the fluid secretion. These triturated with an equal quantity of talc, then suspended in water; the precipitate which subsides is then treated as above. If an alcoholic solution of uroerythrin is treated with a few drops of ammonia, or of fixed alkali, a fine greenish blue color is obtained if the pigment is pure; if contaminated with an accompanying yellow pigment, the color will be olive-green. The latter is usually the case when the extraction has been made with urine. Dilute acids give a bright rose color with uroerythrin solutions, strong acids destroy the color. Zinc salts give no fluorescence, but the acetate forms a bright pink precipitate with uroerythrin solutions.—J. pharm. chim., 16 (1917), 45.

Urine.—*Urea Determination with Xanthydrol.*—Fosse describes the use of this reagent, described on page 493, in urea assays. Urine is filtered and diluted to 10 per cent. and to it are added 35 mils of glacial acetic acid. To this mixture are added in 10 minute intervals, 5 portions of 1 mil each of a 10 per cent. solution of xanthydrol in methyl alcohol. After standing an hour the crystals are collected on a suitable filtering disk under suction, are washed with ethyl alcohol and are dried, after which the firmly caked mass is removed from the filter disk and paper and is weighed. The weight divided by 7 gives the amount of urea. Fosse explains how he used as a filtering disk an ordinary tinned iron strainer 8 Cm. in diameter cemented to the funnel with paraffin. He states that the so-called xanthydrol of commerce is chiefly xanthyl oxide, $O(C_6H_4)_2CH-O-CH(C_6H_4)_2O$, and is insoluble in methyl alco-

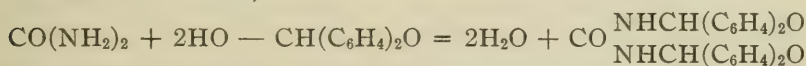
hol. It can be used, however, if it is made into a cold 10 per cent. solution in acetic acid, provided the acid is free from mineral acids and the solution is employed when fresh.—Ann. Inst. Pasteur; through J. pharm. chim., 15 (1917), 258.

Urea and Alkaline Salts.—*Fatal Doses to the Guinea Pig.*—Amberg and Helmholtz find that by intravenous injection into the guinea pig, the lethal dose of a 30 per cent. solution of urea is 4 mils for a 250 Gm. guinea pig. A 1 : 50 solution of ammonium chloride is fatal to 210 to 230 Gm. animals in a dose of 2 mils; the same is true of ammonium acetate, butyrate and β -hydroxybutyrate, the toxicity of the salts being due to the base. The fatal dose of a 1 : 10 sodium chloride is between 6 and 8 mils for a 240 Gm. animal. Potassium salts are much more toxic: 1 mil of a 1 : 50 solution of potassium chloride kills a 260 Gm. guinea pig. Injections of mixtures of sodium and potassium salts are markedly better tolerated than those of potassium salts alone.—J. Pharmacol.; through Pharm. J., 98 (1917), 9.

Xanthidrol.—*A New Urea Precipitant.*—Fosse has found in this substance a valuable urinary reagent. It is diphenopyranol,

$\text{HO} - \text{CH} \begin{matrix} \diagup \text{C}_6\text{H}_4 \\ \diagdown \text{C}_6\text{H}_4 \end{matrix} \text{O}$ which is made by treating xanthone, or

diphenylene ketone, which is obtained by the destructive distillation of salol. Xanthidrol occurs in white crystals, that are soluble in methyl alcohol and which forms with urea an insoluble crystalline body composed of two molecules of the reagent with one molecule of urea,



The molecular weight of this xanthylurea is exactly 7 times that of urea. The reagent does not precipitate any of the other constituents of the urine.—Ann. Inst. Pasteur; through J. pharm. chim., 15 (1917), 256.

Uric Acid.—*Determination of Traces in Blood. Urine, Etc.*—Kowarsky obtained accurate results in the estimation of uric acid, if the proteins were first removed by precipitation, and the uric acid were precipitated in the filtrate, after concentrating this to 2 mils, by ammonium chloride, the ammonia in the precipitate being estimated by the formalin method.—Berl. klin. Wochschr., 54 (1917), 987; through J. Chem. Soc. Abs. (A. V.)

Urochromagen.—*Determination and Properties of.*—Weiss suggests the estimation of urochromagen in urine by 2 methods. The urochrome can be formed by oxidation by permanganate and then be estimated colorimetrically or the amount of $N/100$ permanganate needed to produce the maximum amount of urochrome can be determined by another method described in detail in the original article. The suggestion is made that urochromagen contains a pyrrol nucleus.—*Biochem. Z.*, 81 (1917), 342; through *J. Chem. Soc. Abs.* (A. V.)

Bile.—*Cholagogue Action of.*—The view that bile absorbed from the alimentary tract increases the secretion of bile, and thus acts as a true cholagogue, seems to be established. The feeding of fresh bile to bile fistula dogs causes an almost constant cholagogue action. The bile of the dog, sheep and pig all have this effect, and ox bile seems to be the most active cholagogue. Of the bile constituents, glycocholic acid has a moderate cholagogue effect, but usually causes a great drop in bile pigment output in a bile fistula dog; taurocholic acid has a strong cholagogue action, but little inhibiting effect on bile pigment secretion; the bile fat has no influence on bile flow, but causes inhibition of bile pigment secretion; cholic acid has little effect on bile flow but may decrease the bile pigment output.—*J. Am. Med. Assoc.*, 69 (1917), 386. (W. A. P.)

Bile Constituents.—*Taurine in Tuberculosis.*—Facts suggesting some relation between the bile constituents and resistance to tubercular infection induced M. Takeoka to experiment on animals with taurine, the most characteristic amino acid of the bile. Guinea pigs, infected with either bovine or human tuberculosis, were injected with taurine. In nearly every instance the controls died before the animals thus treated, and the contrast in the extent of visible tuberculosis between controls and taurine-treated animals was very marked. In many of the latter the disease was arrested and apparently cured, even when the taurine was administered as late as three weeks after inoculation. *J. Infect. Dis.*; through *Pharm. J.*, 98 (1917), 439.

Bile Pigments.—*Determination of.*—H. Rosenberg applies the following method: 10 mls of urine are mixed with an equal volume of 30 per cent. caustic potash solution and 2 to 3 drops of a 10 per cent. solution of copper sulphate, when in the presence of gall-pigments an olive-green color will be produced in the mixture.—

Münch med. Wochschr.; through Pharm. Weekblad, 54 (1917), 168. (H. E.)

Bile Pigments.—*Detection in Blood Serum.*—Reveillelet gives the following method for detecting bile pigments and urobilin in blood serum. Ten mils of the blood are allowed to coagulate, the serum decanted and mixed with 3 to 4 mils of Denigès' mercuric sulphate reagent. The mixture is allowed to stand, the precipitate is collected on a filter or separated by centrifuging and washed with water. It is then mixed in a test-tube with 5 to 10 mils of alcohol containing 5 per cent. by volume of hydrochloric acid and the tube placed in a boiling water-bath for 2 to 3 minutes. The mixture is then allowed to cool. When bile pigments are present the alcoholic liquid is colored green, blue or violet, the intensity of the color depending on the amount of bile pigments present. If the liquid is colored brown it is mixed with 2 drops of hydrogen dioxide solution and heated again in the water-bath. A green color is produced when pigments are present. For detecting urobilin 4 to 5 drops of glacial acetic acid are added to the above filtrate and wash-water, followed by a few drops of ferric chloride solution. The mixture is then boiled, cooled, filtered into a separatory funnel and shaken out with 5 mils of chloroform. The chloroformic layer is separated and mixed drop by drop with a 1 per cent. alcoholic solution of zinc acetate until a turbidity is produced. A characteristic green fluorescence occurs when the serum contains urobilin or its chromophores.—L'Union pharm.; through Drug. Circ., 61 (1917), 76.

Blood.—*Calcium Content of.*—It has been found that the calcium content of the blood plasma of cattle is remarkably constant, even when there is a continuous withdrawal as a result of pregnancy or lactation. It has also been found that there is no marked deviation from the normal in the calcium content of the blood serum of patients in the various stages of pulmonary tuberculosis. Even when a high milk diet was furnished over long periods, the calcium content of the blood was not increased above normal. Further, it was shown that the calcium content of the blood serum of normal human adults did not differ from that in sufferers from tuberculosis. Finally, it has been found that the calcium content of blood plasma differs little from the normal in advanced cases of uremia or in hemophilia or in purpura hemorrhagica.—J. Am. Med. Assoc., 68 (1917), 1915. (W. A. P.)

Blood.—*Chlorine Assay of Serum of.*—M. Laudat describes the following rapid method of chlorine assay devised in the laboratory of Professors Grimbert and Widai, which has been found as exact as the more complicated methods of Carius and of Will and Varrentrapp.

In a beaker are mixed 5 mls of blood serum, 10 mls of tenth-normal silver nitrate V. S., 6 mls of a saturated solution of potassium permanganate and 10 mls of nitric acid (40° B.). The mixture is boiled until a clear fluid is obtained, it is then cooled, brought to 100 mls with water and is then titrated for residual silver nitrate with tenth-normal potassium sulphocyanate V. S.; ferric alum being used as indicator.—J. pharm. chim., 16 (1917), 168.

Blood.—*Assay of Glucose in.*—Bauzil and Boyer state that normal blood contains 0.65 to 1.50 grammes of glucose per liter and that variations from these limits suggests pathological conditions; hence the glucose assay of blood is sometimes a distinct aid in diagnosis. After discussing the several methods of assay suggested by other writers and after pointing out their respective defects, the authors recommend the following method:

The freshly drawn blood (15 mls) is coagulated either by heating with sodium sulphate and a few drops of acetic acid or by treating with alcohol and then with sodium sulphate and acetic acid, after which the mixture is filtered and an aliquot part of the filtrate (in either case representing 12 mls of the original blood), which should be colorless and free from albuminoids, fat, and pigments, is assayed for glucose, with an excess of Fehling's solution; the residual copper in the filtrate being determined by titration with potassium cyanide solution of known titer or with potassium cyanide, potassium iodide and tenth-normal silver nitrate V. S.—J. pharm. chim., 16 (1917), 171.

Blood.—*Phosphates in Serum.*—Feigl concludes on the basis of his own results and those reported in literature that the amount of soluble phosphorus in normal cases is mostly less than 0.004 per cent. and reaches occasionally 0.010 per cent. Much higher amounts have been found in certain pathological sera.—Biochem. Z., 81 (1917), 380; through J. Chem. Soc. Abs. (A. V.)

Blood.—*Uses of Phosphotungstic Reagent.*—R. Clogne discusses suggested methods of determination of urea in the blood and especially the clarification methods of Widai, Moog and Moreign,

prior to the actual urea assay with hypobromite. Of these methods he prefers Moreign's use of phosphotungstic reagent, which is prepared by dissolving 20 grammes of crystalline sodium tungstate and 10 grammes of phosphoric acid, sp. gr. 1.14, in 100 grammes of distilled water, after which the mixture is boiled for 20 minutes, (replacing the water lost by evaporation), made alkaline, then acidulated with hydrochloric acid and finally filtered after standing.

The paper gives details of manipulation of blood, blood serum and cephalo-rachidian fluid. It also describes the determination of the albumin in the latter fluid by precipitation with phosphotungstic reagent, measuring the precipitate in a special graduated tube.—J. pharm. chim., 16 (1917), 325.

Blood.—*Detection of Picric Acid in.*—Tixier and Bernard give the following method for detecting picric acid in blood. Fifteen drops of blood are mixed with 3 mls of a 9.5 per cent. sodium chloride solution. After allowing the mixture to stand for 24 hours one or two mls of the serum, which when picric acid is present exhibits a yellow color, are mixed with one or two mls of methylene blue solution (1 : 50,000) and after the lapse of 15 minutes the mixture is shaken out with 10 to 15 drops of chloroform. In the presence of as little as 0.004 gramme of picric acid in one liter of blood the chloroform will be colored green. Blood serum from persons suffering from jaundice when treated in the same manner will impart to the chloroform only a blue color. Quinine, antipyrine, aspirin, bromides, iodides, phenol derivatives, etc., administered to patients do not interfere with the reaction.—Progres. méd.; through Drug. Circ., 61 (1917), 133.

Blood.—*Detection of Picric Acid in.*—The following simple method for detecting picric acid in the blood of persons feigning jaundice is given by Castaigne and Desmoulières. Fifteen to 20 mls of blood are mixed with an equal volume of a 25 per cent. trichloroacetic acid solution and the mixture filtered until a clear filtrate is obtained. With the blood of healthy persons and those suffering with even severe cases of jaundice a colorless filtrate is obtained, while the presence of picric acid manifests itself by a more or less yellow color of the liquid.—Rep. pharm.; through Drug. Circ., 61 (1917), 75.

Blood.—*Urea Determination with Xanthidrol.*—Fosse assays blood for urea by precipitating the albumin with a concentrated

Tanret reagent; 10 mls of blood being centrifuged with 10 mls of the reagent and to 15 mls of the clear serum, 15 mls of glacial acetic acid and 1.5 mls of 10 per cent. methyl alcohol solution of xanthidrol (pages 492 and 493) are added. After an hour the crystals of xanthylurea are collected, are washed with ethyl alcohol are dried and are weighed. The weight divided by 7 gives the amount of urea.—Ann. Inst. Pasteur; through J. pharm. chim., 15 (1917), 258.

Blood.—*Uric Acid Assay in Bright's Disease.*—P. Bartholow has devised a test depending upon the blue color developed in reaction between uric acid and sodium phosphotungstate. A solution of the latter is used, and is made as follows: 100 Gm. of sodium tungstate are dissolved in 80 mls of 85 per cent. phosphoric acid and 700 mls of water; the whole is boiled for several hours and diluted to one liter. The test is: 1 mil of blood is sufficient, but it is generally convenient to draw 2 mls into a test-tube. When the serum is clear, 0.1 mil is pipetted into another test-tube and 2 mls of a 7.5 per cent. solution of sodium carbonate are added. To this 0.4 mil of the solution of sodium phosphotungstate is added and a blue color, varying in degree according to the uric acid in serum, spreads beautifully throughout the liquid. In using this test in Bright's disease, the best method is to compare the color of the reaction with a color scale. The author makes such a scale, increasing in intensity from 10 to 100. As examples of its use, two cases of nephritis with retention gave values corresponding to 70 and 80 on the scale. A color corresponding to 80 and 90 is characteristic of nephritis, parenchymatous and interstitial. Experience will actually class those cases which give the deepest color. It is not easy to determine the corresponding quantity of uric acid. If the test solution is added to a standard solution of uric acid and lithium carbonate, it has been found that the color produced by 5 mls of this solution corresponds to 1 Gm. of uric acid in 100 mls. It is important that too much serum must not be used, and the sodium carbonate solution should be added to the serum, not *vice versa*.—Lancet; through Pharm. J., 98 (1917), 319.

ALPHABETICAL LIST OF MEMBERS

HONORARY LIST.

Greenish, Henry George, London.....	1913
Holmes, E. M., F. L. S., 17 Bloomsbury Square, London, W. C. England.	1899
Hooper, David, F.I.C., F.C.S., 14 Victoria Park, Weston, Supermere, England.....	1899
Meyer, Professor Dr. Arthur, Marburg, Germany.....	1910
Schelenz, Professor Dr. Hermann, Kaiser Str., 53 I Cassel, Germany	1912
Schmidt, Professor Dr. Ernst, Geh. Regierungsrath, Marburg, Germany....	1899
Tschirch, Professor Dr. Alexander, Berne, Switzerland.....	1910
Zoernig, Dr. Heinrich, Basel, Switzerland.....	1916

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(List corrected to April 24, 1919.)

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- | | |
|---|---|
| Abbett, Wm. A.,
219 W. Superior st., Duluth, Minn. | Akers, John W., Jr.,
Mill Creek, Oklahoma. |
| Aberwald, Louis James,
940 Marshall ave., St. Paul, Minn. | Alacán, José P., Phar.D.,
Calle 17 entre, Ky. L. Vedado,
Havana, Cuba. |
| Abrahamson, Carl,
540 W. Randolph st., Chicago, Ill. | Alacán, Sylvia C.,
17 No. 21, Vedado, Havana, Cuba. |
| Abreu, Gerardo F.,
103 San Miguel st., Havana, Cuba. | Albers, Wm. W.,
301 3rd st., Wausau, Wis. |
| Acheson, Wm. R.,
8 Park ave., Cambridge, Mass. | Albert, Moses Mordechai, B.A., B.C.,
M.Pharm.,
Baub-Ed-Driss (Albert's Pharmacy),
Beirut, Syria, Turkey. |
| Ackerman, Philip J.,
549 N. High st., Columbus, O. | Albrecht, Albert,
Port-au-Prince, Haiti c. U. S. |
| Ackermann, A. H., Phar.D.,
313 Union st., Lynn, Mass. | Marine, E.F., c. Postmaster,
N. Y. |
| Ackermann, Albert G., Ph.G.,
4228 Irving Park Blvd., Chicago, Ill. | Alden, Harley Roscoe,
4 Lisbon st., Lewiston, Maine. |
| Adamick, Gustave H.,
180 Market st., Chicago, Ill. | Alkire, Lewis L.,
1596 So. Pearl st., Denver, Colo. |
| Adams, Arthur E.,
71 Genesee st., Auburn, N. Y. | Allard, Herman Joseph,
Technology Chambers, Boston, Mass. |
| Adams, James H.,
Box 118, Sagamore, Mass. | Allen, E. Floyd,
1538 Nicollet ave., Minneapolis,
Minn. |
| Adams, Walter D.,
Forney, Texas. | Allen, Wm. H.,
Detroit Technical Institution, De-
troit, Mich. |
| Adams, William Jackson,
1901 2d ave., Birmingham, Ala. | Allison, Wm. O.,
100 William st., New York, N. Y. |
| Adler, Arthur,
973 Fox st., New York, N. Y. | Alsberg, Carl L., A.B., A.M., M.D.,
Cosmos Club, Washington, D. C. |
| Adler, Max S.,
Box 9-R. R. No. 1, Bowling Green
Fla. | Altman, Jos.,
919 Intervale ave., New York, N. Y. |
| Adoff, Morris,
546 Claremont Pkway, Bronx,
New York, N. Y. | Altstadt, Benjamin W.,
2248 N. Central Park ave., Chi-
cago, Ill. |
| Ahlborn, Frank H.,
1144 Bryn Mawr ave., Chicago, Ill. | Ambler, Jessie H.,
412 Elm st., St. Louis, Mo. |
| Ahrendts, C. H.,
30 Metcalf st., Wilkes-Barre, Pa. | |
| Ajello, Anthony L.,
109 Carroll st., Brooklyn, N. Y. | |

- Amos, Wilber S.,
c. McPike Drug Co., 7th and
Central sts., Kansas City, Mo.
- Amrhein, Florin Joseph,
61 Fort ave., Roxbury, Boston,
Mass.
- Anderson, Adolph Emil,
1162 13th ave., Moline, Ill.
- Anderson, Charles William,
601 N. West st., Indianapolis, Ind.
- Anderson, John,
c. E. R. Squibb & Son, New
Brunswick, N. J.
- Anderson, John Gustav,
Wadena, Minn.
- Anderson, Wm. C., Ph.G., Phar.D.,
315 Greene ave., Brooklyn, N. Y.
- Anding, C. E.,
Flora, Miss.
- Andrade, Cesar Daniel,
P. O. Box 703, Guayaquil, Equador,
S. A.
- Andrews, George M.,
9-11 N. Main st., Woodstown, N. J.
- Andrews, Lionel T.,
3917 Syvssset St., Woodhaven, L. I.,
N. Y.
- Anspach, Paul B., Ph.G.,
61 N. 4th st., Easton, Pa.
- Anthony, Edwin P.,
178 Angell st., Providence, R. I.
- Antonow, Samuel L.,
1360 S. Springfield, Chicago, Ill.
- Antony, Charles W.,
207 Tuscarawas st., W., Canton, O.
- Apmeyer, Chas. A.,
2546 Auburn ave., Cincinnati, O.
- Apple, Franklin M., Ph.G., Phar.D.,
3233 W. Berks st., Philadelphia, Pa.
- Appleton, Wm. R.,
Lock Box 162, Warren, Ark.
- Arbaugh, Rufus C., Ph.G.,
Jasper, Ark.
- Archer, Fred W.,
1181 Washington st., Dorchester,
Mass.
- Arlidge, I. Curtis,
4242 Wirt st., Omaha, Neb.
- Armentano, Anthony,
321 E. 109th st., New York, N. Y.
- Armstrong, Byron,
Jacksonville, Ill.
- Armstrong, Thomas Call,
U. S. Marine Hospital, Chelsea,
Mass.
- Arnaud, Adrian Andrew,
417 Cherokee st., New Orleans, La.
- Arneson, Theodore A.,
413 S. 6th st., Montevideo, Minn.
- Arney, Mabel F. (Miss),
Center Hall, Pa.
- Arnold, Henry C. F.,
P. O. Box 71, Berlin, N. H.
- ARNY, HARRY V., Ph.G., Ph.D.,
115 W. 68th st., New York, N. Y.
- Asher, Philip,
912 Broadway, New Orleans, La.
- Aston, E. Arthur,
453 N. Main st., Wilkes-Barre, Pa.
- Atkinson, C. W.,
Box 1521, Dallas, Texas.
- Austin, Richard A.,
Cairo, N. Y.
- Avery, Chas. H.,
5460 Ridgewood st., Chicago, Ill.
- Avis, James L.,
83 S. Main st., Harrisonburg, Va.
- Ayers, John Raymond, Jr.,
39 Mountford st., Boston, Mass.
- Babcock, Percival W.,
71 Lisbon st., Lewiston, Me.
- Bachman, Gustav,
Minn. Coll. Phar., Minneapolis,
Minn.
- Baer, Edward A.,
Bakersfield, Calif.
- Baer, Herbert O.,
12th and Chapline sts., Wheeling,
W. Va.
- Baer, Jacob M.,
2000 Chestnut st., Philadelphia, Pa.
- Bagley, Anna G.,
48 E. Patterson ave., Columbus, O.
- Baier, Albert E.,
322 S. Liberty ave., Alliance,
Ohio.
- Baird, Harold G.,
523 W. 120th st., Chicago, Ill.
- Baker, Benjamin,
520 Delancey St., Philadelphia, Pa.

- BAKER, EDWIN,
34 Bridge st., Shelbourne Falls,
Mass.
- Bakkers, Mrs. Neff K.,
10900 S. Michigan ave., Chicago, Ill.
- Ballagh, Wilfred T.,
S. E. Cor. Square, Nevada, Mo.
- Ballard, Chas. W., Ph.C., Phar.D.,
M.A.,
c. Columbia University, 115 W.
68th st., New York, N. Y.
- BALLARD, JOHN W., Ph.G.,
106 W. 2nd st., Davenport, Ia.
- Ballou, Clarence O.,
9th and Idaho, McCarty Bldg.,
Boise, Idaho.
- Balmert, Clemens A., Phar.D.,
Residence Unknown.
- BALSER, GUSTAVUS,
137 Ave. B, New York, N. Y.
- Bandel, Chas. Marion,
1159 Masonic ave., San Fran-
cisco, Calif.
- Bandy, Geo. Ph.G.,
Wilbur, Wash.
- Bane, Robert Lyle,
701 So. Wood st., Chicago, Ill.
- Bangert, Howard Wells,
1901 Belmont ave., Chicago, Ill.
- Bangert, Louis Edward,
1901 Belmont ave., Chicago, Ill.
- Banker, P. W.,
203 Pierce st., Kingston, Pa.
- Bankoff, Jacob,
191 Brown Place, Bronx, N. Y.
- Bard, Wm. E.,
108 W. Main st., Sedalia, Mo.
- Barker, Fred A.,
134 Main st., Gloucester, Mass.
- Barnard, Harry E.,
c. State Lab. of Hygiene,
Indianapolis, Ind.
- Barnstead, Sidney Ormon,
3d and Cedar st., c. J. T. Milliken,
St. Louis, Mo.
- Barrett, Charles L.,
40 Harvard ave., Collingswood, N. J.
- Bartholomew, Wm. C.,
3218 N. Capitol ave., Indianapolis,
Ind.
- Bartlett, James E.,
c. Parke, Davis & Co., 162 N.
Franklin st., Chicago, Ill.
- Bartlett, Kenneth A.,
York and Washington sts., c.
E. R. Squibb Co., Brooklyn,
N. Y.
- Bartley, Deane C.,
1219 W. 11th ave., Spokane, Wash.
- Base, Daniel, A.B., Ph.D.,
3905 Alto ave., Windsor Hills,
Baltimore, Md.
- Bass, Francis Marion,
Decherd, Tenn.
- BASSETT, CHAS. H., Ph.G.,
109 Arch st., Boston, Mass.
- Batdorf, Lydia Franke (Miss),
4125 W. Bell st., St. Louis, Mo.
- Bateman, Herbert H.,
337 N. Higgins ave., Missoula,
Mont.
- Baudin, Lucius C.,
R. R. avenue., Donaldsonville, La.
- Baum, Fred C.,
F. R. S. 99, Ft. Slocum, N. Y.
- Baum, William Franklin,
318 Vermilion st., Danville, Ill.
- Beach, DeMott Clark,
7570 Jefferson ave., Brooklyn,
N. Y.
- Beal, Geo. D., Phar.D.,
Chemistry Bldg., University of
Illinois, Urbana, Ill.
- Beal, James H., Sc.D., Phar.D.,
801 W. Nevada st., Urbana, Ill.
- Beall, Herbert Ninian,
1525 Connecticut ave., N. W.,
Washington, D. C.
- Bear, Pierce B.,
787 Broad st., Newark, N. J.
- Beard, John A.,
205 Main st., McComb, Miss.
- Beard, John G.,
Chapel Hill, N. C.
- Beardsley, Andrew H.,
117 W. Franklin st., c. Dr. Miles
Med. Co., Elkhart, Ind.
- Beath, Orville Andrew,
815 University ave., Laramie, Wyo.

- Beavo, Mabel S. (Mrs.),
4112 N. Springfield ave., Chicago,
Ill.
- Bechmann, Agnes Pauline,
Creede, Colo.
- Becker, Irwin A., B.S., Ph.G.,
c. Michael Reese Hospital, Chi-
cago, Ill.
- Becker, Maxwell M.,
1233 Choctaw, Dewey, Okla.
- Behrens, Emil C. L.,
2028 S. Halsted st., Chicago, Ill.
- Behrens, John F.,
19 Cone st., Orange, N. J.
- Beilstein, Christian,
P. O. Box 1554, Manhattan, New
York.
- Beise, John H.,
125 Lincoln ave., W., Fergus
Falls, Minn.
- Bellack, Julius S.,
1508 E. 57th st., Chicago, Ill.
- Benfield, Chas. Wm.,
6924 Lexington ave., Cleveland, O.
- Bennett, George M.,
135-37 W. Main st., Urbana, Ill.
- Bennett, J. R.,
169 Park ave., Wilkes-Barre, Pa.
- Bennett, Kelly Edwin,
8 Everett st., Bryson City, N. C.
- Bent, Edward C.,
Dell Rapids, S. D.
- Benton, L. N.,
31 S. Broadway, Aurora, Ill.
- Benton, Wilbur M.,
111 High st., Peoria, Ill.
- Benton, William Mayze,
246 75th St., Brooklyn, N. Y.
- Bentson, Bernard L.,
809 8th st., S. Fargo, N. D.
- Bentz, Henry G.,
894 Michigan ave., Buffalo, N. Y.
- Beranek, Edward Frank,
Ord, Neb.
- Bercou, Jack D.,
937 S. 14th ave., Minneapolis, Minn.
- Berenguer, José M.,
Santiago de Cuba, Oriante.
- Berg, Frantz F., Ph.G.,
3540a Crittenden St., St. Louis, Mo.
- Berg, Leroy,
122 Academy st., Wilkes-Barre, Pa.
- Berger, Ernest,
P. O. Box 983, Tampa, Fla.
- Berger, Louis, Ph.G.,
79 E. 130th st., New York, N. Y.
- Bergman, Max,
1570 Bathgate ave., New York, N. Y.
- Bergren, Elvin R.,
Odebolt, Ia.
- Bergstein, Leonard,
509 N. Lake st., Madison, Wisc.
- Bergy, Gordon Alger,
Morgantown, W. Va.
- Beringer, Geo. M.,
501 Federal st., Camden, N. J.
- Beringer, Geo. M., Jr., P.D.,
1033 Cooper st., Camden, N. J.
- Berner, Carl A.,
1554 E. Grand ave., Des Moines, Ia.
- Bernhard, Albert Henry,
Asst. Surgeon U. S. N., Head-
quarters 6th Reg., Great
Lakes, Ill.
- Bernhart, Peter K., Ph.G.,
114 N. Phillips ave., Sioux Falls,
S. D.
- Berniker, Isaac,
1735 Washington ave., New York,
N. Y.
- Bernstein, Chanon A.,
3136 Broadway, New York, N. Y.
- Bernstein, Mitchell,
1437 S. Broad st., Philadelphia,
Pa.
- Bertram, E. O.,
614 Helen ave., Detroit, Mich.
- Bertrams, Henry,
Augusta, Ky.
- Best, Frank Merrell,
120 N. 3rd st., Lafayette, Ind.
- Best, John,*
2015 E. 12th st., Denver, Colo.
- Betz, Otto E.,
S. E. Cor. Erie ave. and Edwards
Road, Cincinnati, Ohio.
- Betzel, Irwin Leonard,
1426 E. 18th st., Portland, Oregon.

- Beucler, William George,
 202 Ouray Bldg., 805 G st.
 N. W., Washington, D. C.
 Beukma, Cornelius,
 2704 Ross ave., Dallas, Texas.
 Beukma, Wm.,
 2217 Glenarm Pl., Denver, Colo.
 BEYSCHLAG, CHAS.,
 503 Main st., La Crosse, Wis.
 Bianco, Ernest Oreste,
 Evac. Hospital No. 14, A. E. F.,
 Germany.
 Bianco, Mike Robert,
 Du Quoin, Ill.
 Bibbins, Francis E., Ph.G.,
 4246 Cornelius ave., Indianapolis,
 Ind.
 Bidwell, Charles,
 Albion, Ind.
 Bienstock, Samuel,
 990 Broad st., Hartford, Conn.
 Biesty, Patrick Joseph,
 12 Haverford st., Jamaica Plain,
 Mass.
 Bigelow, Clarence O.,
 106-108 6th ave., New York, N. Y.
 Bilhuber, Ernst,
 45 John st., New York, N. Y.
 Billig, Benjamin,
 4003 Third ave., New York, N. Y.
 BINGHAM, CHARLES CALVIN,
 37 Main st., St. Johnsbury, Vt.
 Bingham, Wm. E., A.B.,
 1916 Broad, Tuscaloosa, Ala.
 Binz, Edward G.,
 732 Ceres ave., Los Angeles, Cal.
 Biosca, Palcido, M.D., D.S., Phar.D.,
 Prof. Physics,
 21 y M. Vedado, Havana, Cuba.
 Birch, May C. (Mrs.), Ph.G.,
 Orland, Glenn Co., Cal.
 Bird, Richard B.,
 908 Main st., Winfield, Kans.
 Bischoff, H. E.
 118 Fourth st., Union Hill, N. J.
 Bishop, William Penn,
 Crockett, Tex.
 Bitowski, Charles Casimir,
 123 High St., Holyoke, Mass.
- Bize, Marshall L.,
 7th ave., Ybor City, Tampa, Fla.
 Black, Franklin,
 81 Maiden Lane, New York, N. Y.
 Black, James A., Phar.D.,
 804 N. Carey st., Baltimore, Md.
 Blackwood, Russell T.,
 52nd and Girard ave., Philadel-
 phia, Pa.
 Blair, Henry C.,
 Walnut and 8th sts., Philadelphia,
 Pa.
 Blake, Lynn Stanford,
 Auburn, Ala.
 Blakeley, Geo. C.,
 3131 2nd st., The Dalles, Ore.
 Blakeslee, Louis Geo.,
 Mallinckrodt Chemical Works,
 St. Louis, Mo.
 Blalock, Jesse N.,
 1431 Fourth ave., Seattle, Wash.
 Blanding, Wm. O.
 54 Weybosset st., Providence, R. I.
 Blank, Herman G., Jr., Ph.D.,
 Wilson, Pa.
 Blank, Nicholas J.,
 10th and Isabella sts., Newport, Ky.
 Bletcher, Henry E. J.,
 422 Notre Dame, Winnipeg, Man.,
 Can.
 Blocki, John,
 117 E. 13th st., Chicago, Ill.
 Blodau, Robert P.,
 402 Indiana ave., Indianapolis, Ind.
 Blome, Walter H.,
 426 Baldwin ave., Detroit, Mich.
 Blomeier, Herman Henry,
 439 9th ave., New York, N. Y.
 Blomquist, Arthur Theodore,
 Osakis, Minn.
 Bloom, Cecil Read,
 Johnson Block, Cherry st., Clear-
 field, Pa.
 Bluestone, Isadore,
 2130 5th ave., Pittsburgh, Pa.
 Blumenkranz, Isidore Jacob,
 234 Rivington st., New York, N. Y.
 Blumenschein, Fred J.,
 7217 Kedron ave., Pittsburgh, Pa.

- Blumenthal, Isadore F.,
N. W. Cor. Linton and Nassau
sts., Cincinnati, O.
- Boas, Auguste,
528 Cambridge st., Allston, Mass.
- Boberg, Otto J. S.,
206 S. Barstow st., Eau Claire, Wis.
- Bodemann, Wilhelm,
5018 Lake Park ave., Chicago, Ill.
- Bodin, Edwin T.,
Bay City, Mich.
- Bodinus, Edmund,
2520 Cedar st., Milwaukee, Wis.
- Boehm, John J.,
1901 S. Halsted st., Chicago, Ill.
- BOEHM, SOLOMON,
800 Morgan st., St. Louis, Mo.
- BOERNER, EMIL L.,
113 Washington st., Iowa City, Ia.
- Bohmanson, Robert H.,
3rd and F sts., Eureka, Cal.
- Bohn, George W.,
520 Upper 8th st., Evansville, Ind.
- Bolenbaugh, Albert,
School of Pharmacy, Medical
College of Virginia, c. Dr. E. L.
C. Miller, Richmond, Va.
- Bollinger, Clifford H.,
c. Noyes Bros. and Cutler, St.
Paul, Minn.
- Bolte, Frank,
1539 Baymiller st., Cincinnati, O.
- Bomba, Onufry J.,
Poth, Tex.
- Bongartz, Ferdinand A.,
353 Palisade ave., Jersey City
Heights, N. J.
- Bongiovanni, Joseph Nathaniel,
6th and Washington ave., Phila-
delphia, Pa.
- Booth, Clarence Frederick,
52 Woodward ave., Buffalo, N. Y.
- BORING, EDWARD M.,
N. E. Cor. 10th and Fairmount
ave., Philadelphia, Pa.
- Borst, Harry J.,
720 N. LaSalle st., Indianapolis,
Ind.
- Bosley, John Oliver,
1401 King st., Wilmington, Del.
- Bosque, Arturo C.,
38 Fejadillo st., Havana, Cuba.
- Bosserman, Charles Emmett,
Newport, Pa.
- Bossert, Henry,
281 E. Market st., Wilkes-Barre, Pa.
- Bote, Lester Elmer,
Hospital Corps, Training School,
Great Lakes, Ill.
- Bowen, Cyrus W., Ph.G., B.S., M.S.,
M.D.,
Broadway and Jackson, Bruns-
wick, Mo.
- Bower, Edwin L.,
Tenafly, N. J.
- Bowles, Henry Edward,
Wendell, Idaho.
- Bowman, Reginald Hamilton,
Fortuna, Cal.
- Bowman, Waldo M.,
319 Superior st., Toledo, O.
- Boyles, Frank M.,
c. McCormick & Co., Baltimore,
Md.
- BRACK, CHARLES E.,
Ensor and Forrest sts., Balti-
more, Md.
- Braconier, Frank Gunmar, Ph.G.,
1145 Main st., Campello, Brock-
ton, Mass.
- Bradbury, Wymond H., Phar. D.,
459 C st., N. W., Washington, D. C.
- Bradley, Ambrose Allan,
Williston, N. D.
- Bradley, Theo. J.,
Mass. Coll. of Pharm., Boston,
Mass.
- Bradt, Frederick T.,
1104 Virginia Park, Detroit, Mich.
- BRADT, WARREN L.,
State Education Bldg., Albany,
N. Y.
- Brakke, Nols N.,
McVile, N. D.
- Brandis, Ernest L.,
Room 8, Capitol Bldg., Rich-
mond, Va.
- Braubach, Charles,
c. Merrell Chemical Co., 5th &
Butler sts., Cincinnati, Ohio.

- Braun, Carl L.,
24 N. High st., Columbus, O.
- Breckenridge, John Y., Jr.,
Pine City, Minn.
- Brehler, Oscar A., Ph.G.,
P. O. Box 128, Sanger, Fresno,
Co., Cal.
- Breining, M. H.,
Dilley, Tex.
- Breitenbach, Max J.,
53 Warren st., New York, N. Y.
- Breivogel, Philip J.,
2134 La Fontaine ave., New
York, N. Y.
- Brennan, James Edward,
Sheldon Bldg., Pawtucket, R. I.
- Brenner, Louis C.,
Gonzales, Texas.
- Breves, Rudolph,
1109 North ave., Waukegan, Ill.
- Brewer, Howard D.,
19 Oxford st., Worcester, Mass.
- Brewer, James Edward,
215 Summit st., Morristown, Pa.
- Brewer, Justin S.,
812 Goodfellow ave., St. Louis,
Mo.
- Brickelmaier, Paul H.,
38 Park Place, New York, N. Y.
- Bridal, Velvie,
Marshall, Okla.
- Briggs, Andrew G.,
204 Howitzer Place, Richmond, Va.
- Briggs, Clifton Henry,
c. Parke, Davis & Co., Detroit,
Mich.
- Briles, David Thomas,
Rocky Mount, N. C.
- Brill, Frederic Bernhard,
2278 Main st., Stratford, Conn.
- Brinton, Clement S.,
134 S. 2nd st., Philadelphia, Pa.
- Brisson, Alfred Frederick,
Residence unknown.
- Britt, William E.,
Juneau, Alaska.
- Brockhoff, Lewis Paul,
1269 W. 73rd st., Chicago, Ill.
- Broe, James Augustine,
489 Congress st., Portland, Me.
- Brookley, Will,
Edgar, Neb.
- Brooks, Frederick Pratt,
702 Washington st., Norwood, Mass.
- Brown, Andrew,
1418 Pittston ave., Scranton, Pa.
- Brown, Arthur Nutter,
27 Warwick st., Boston, Mass.
- Brown, Clark L.,
830 N. W. Taylor st., Washing-
ton, D. C.
- Brown, Edwin A.,
101 W. 3rd st., Winona, Minn.
- Brown, Floyd W.,
4 W. Main st., Lead, S. D.
- Brown, Frank S.,
217 W. 5th ave., Knoxville, Tenn.
- Brown, George W.,
261 College ave., Kingston, Pa.
- Brown, George Wilton,
1001 Washington ave., Evans-
ville, Ind.
- Brown, James L., Ph.G.,
193 Front st., Marshfield, Ore.
- Brown, Lewis Nathan,
115 W. 68th st., New York, N. Y.
- Brown, Linwood A., Ph.C., Pharm.D.,
c. Experimental Sta., Lexington,
Ky.
- Brown, Robert Owen,
612 8th st., Wichita Falls, Tex.
- Browne, Howard S.,
538 Chautauqua ave., Norman,
Oklahoma.
- Brugh, Ewell Ashby,
Altavista, Va.
- Bruker, J. Harry,
1908 Cleneay ave., Norwood, O.
- Brunelle, Albert J.,
1801 S. Main st., Fall River, Mass.
- Bruun, Harold N.,
3431 W. North ave., Chicago, Ill.
- Brunstrom, Chas., Ph.G.,
601 4th ave., Moline, Ill.
- Bryant, David K.,
302 Conley ave., S., Thief River
Falls, Minn.
- BRYSON, WM. S., Ph.C., M.D.,
New Sheffield, Pa.

- Buckland, Thomas A.,
 9 Municipal Courts Bldg., St.
 Louis, Mo.
 Buckner, John C.,
 928 Church st., Galveston, Tex.
 Buehler, John J.,
 Pocatello, Idaho.
 Buengar, Albert,
 1200 15th st., Denver, Colorado.
 Bullard, Morton Leonard,
 Box 54, Dexter, Me.
 Bundy, Ernest Frank,
 177 Jos. Campau ave., Detroit, Mich.
 Burda, Stanislaus W.,
 1363 N. Ashland ave., Chicago, Ill.
 Burdette, Bernard C.,
 38 High st., Clinton, Mass.
 Burdick, Dr. Alfred S.,
 2148 Gidding ave., Chicago, Ill.
 Burdick, Merle M.,
 4846 N. Hermitage ave., Chicago, Ill.
 Burger, Louis J.,
 215 N. Charles st., Baltimore, Md.
 Burgheim, Jacob,
 209 Main st., Houston, Tex.
 Burke, Mark,
 19 S. Washington st., Wilkes-
 Barre, Pa.
 Burkett, K. S.,
 1613 B ave., Altoona, Pa.
 Burkhart, George Adrian,
 4159 Magnolia st., St. Louis, Mo.
 Burnham, Alfred A., Jr.,
 459 Dudley st., Boston, Mass.
 Burns, William Carroll,
 303 E. Houston Sq., San Antonio,
 Tex.
 Burnside, Carl Bishop,
 501 W. 8th st., Davenport, Ia.
 Burrin, Philo LaMont,
 c. Eli Lilly & Co., Indianapolis,
 Ind.
 Burrows, Roscoe Tracy,
 Noank, Conn.
 Burton, John C.,
 3rd st., Stroud, Okla.
 Busch, Henry P.,
 1006 Spruce st., Philadelphia, Pa.
 Busch, Miers,
 1006 Spruce st., Philadelphia, Pa.
- Buschemeyer, Henry, Jr.,
 4th ave., Cor. Jefferson, Louis-
 ville, Ky.
 Bush, Burton T.,
 18-20 Platt st., New York, N. Y.
 Buss, Oliver C.,
 c. Parke Davis & Co., 162 N.
 Franklin st., Chicago, Ill.
 Bustillo, Dra Sarah (Miss),
 Buenaventura 40, Vilora, Havana,
 Cuba.
 Butler, Guy,
 Holbrook, Neb.
 Butters, Chas. H.,
 4132 Lyndale ave., S. Minneapolis,
 Minn.
 Buttery, Lester LeRoy,
 c. Central Drug Store, San An-
 gelo, Texas.
 Buxton, Horace C.,
 Ft. Fairfield, Me.
 Buzzell, Arthur L.,
 550 Field ave., Detroit, Mich.
 Bye, Mortimer,
 166 Gladstone, Detroit, Mich.
 Byerley, Fabian,
 401 Jefferson st., Portland, Ore.
 Byrd, George,
 224 E. Spring st., Fayetteville, N. C.
 Byrnes, Garrett,
 21 Maplewood ave., Maplewood,
 N. J.
 Cabrero, Narcisco Rabell,
 Aquadilla st., San Sebastian, Porto
 Rico.
 Cadmus, Robert C.,
 1941 Spring Garden st., Phila-
 delphia, Pa.
 Cahan, Samuel,
 S. W. Cor. 8th & Dickinson sts.,
 Philadelphia, Pa.
 Cain, Frank B., M.D.,
 Lyric Theatre Bldg., Cincinnati,
 Ohio.
 Calderaro, August,
 541 Bermuda st., Algiers, New
 Orleans, La.
 Calderon, Guillermo,
 700 E. San Antonia st., El Paso,
 Texas.

- Caldwell, A. C.,
112th and Stephenson ave., Chi-
cago, Ill.
- Cale, E. E.,
Ensley, Ala.
- Call, Harry Barrett,
144 Park st., Lawrence, Mass.
- Callaghan, Frank M.,
600 Pelican ave., Algiers, New
Orleans, La.
- Calonge, Luisa F.,
282 Moderno Neptimo st., Ha-
vana, Cuba.
- Campbell, Alexander,
Univ. of Saskatchewan, Saska-
toon, Sask., Can.
- Campbell, Chas. W.,
331 St. Mary's ave., Winnipeg,
Man., Can.
- Campbell, George. Stelle,
Milburn, N. J.
- Campbell, James Clayton,
463 Concord ave., Detroit, Mich.
- Campbell, Milton,
426 S. 13th st., Philadelphia, Pa.
- Campbell, S. Ross,
Cynwyd, Pa.
- Campbell, Theo.,
2101 N. 63rd st., Overbrook,
Philadelphia, Pa.
- Canham, George E.,
5856 S. State st., Chicago, Ill.
- Canis, Otto F. A.,
Jerome ave., Ozone Park, New
York.
- Capdan, Hypolyte E.,
Cor. 8th and Howard sts., New
Orleans, La.
- Capote, Jose,
344 Principe Alfonso, Havana,
Cuba.
- Cardarelli, Eugene James,
34 West Union ave., Bound
Brook, N. J.
- Carey, Henry B.,
1294 9th ave., San Francisco, Cal.
- Carl, Chas. B.,
Greencastle, Pa.
- Carleton, Henry L.,
Taylor, Tex.
- Carmichael, John D.,
Missoula, Mont.
- Carpenter, Mrs. Tom,
458 Greenwich st., Valparaiso, Ind.
- CARRELL, EUGENE AYERS,
35 South st., Morristown, N. J.
- Carroll, Geo. J., Ph.C.,
4 Parker st., Gardner, Mass.
- Carson, Roger L.,
P. O. Box No. 185, Eagle Pass,
Texas.
- Carter, Edgar B.,
810 E. 25th st., Indianapolis, Ind.
- Carter, Frank H.,
776 Mass. ave., Indianapolis, Ind.
- Carter, Fred L.,
1136 Old South Bldg., Boston,
Mass.
- Carter, Harlen Wilson Searight,
Oak Hill Drug Store, Cor. Roose-
velt and Arrow aves., Indianap-
olis, Ind.
- Carter, Quintus Elton,
Bellville, Texas.
- Cartier, Gus O.,
780 Main st., Willimantic, Conn.
- Case, Westwood D.,
Canton, Minn.
- Casey, D. W.,
Red Oak, Ia.
- Casey, Edmund L.,
Chisholm, Minn.
- Casey, Jas. P., M.D.,
424 Woodward st., Detroit, Mich.
- Cason, Charles E.,
3617 Word st., Dallas, Texas.
- Caspari, Chas. E.,
2108 Locust st., St. Louis, Mo.
- Cassaday, Burton,
1 Paris ave., W. Terre Haute, Ind.
- Cassaday, Orlin U.,
c. Averbek Drug Co., Youngs-
town, O.
- Castiex, Martial B.,
339 Bourbon st., New Orleans, La.
- Castro, Dr. A. Rodriquez,
Calle Separacion No. 113, Santo
Domingo, Republica Domini,
Canada.

- Cecalello, James,
301 East 150th st., New York, N. Y.
- Cermak, Emil,
1264-6 S. 13th st., Omaha, Neb.
- Cermak, Frederick Jefferson,
3501 E. 93rd st., Cleveland, O.
- CHANDLER, CHARLES F.,
116th and Amsterdam ave., New York, N. Y.
- Chapman, Chas. J.,
62 Maiden Lane, New York, N. Y.
- Chapman, Oswald,
P. O. Box 217, "Farmacia Nacional," Central ave. and Santa Ana Park, Panama City, Rep. of Panama.
- Chapple, Chas. J.,
2815 3rd ave., N., Bilings, Mont.
- Charkoudian, Leon Nahabed,
252 Worthington st., Springfield, Mass.
- Charles, Corliss D.,
120 Logan st., Denver, Colo.
- Charron, Roy Chester,
24 School st., Leominster, Mass.
- Chase, Walter M.,
Medical Supply Office, Camp Wadsworth, S. C.
- Cheatham, Wm. B.,
c. Associated Pharmacists, 145 Nassau ave., New York, N. Y.
- Chedister, Percy A.,
1275 Curtis st., Denver, Colo.
- Chelf, Roy N.,
Brooksville, Fla.
- Cheney, Arthur L.,
Main and Portland sts., Morrisville, Vt.
- Chez, Isidore Edward,
3701 W. 12th st., Chicago, Ill.
- Chilson, Elmer E.,
326 Monroe ave., Rochester, N. Y.
- Chism, John S., Ph.G.,
150 N. Main st., Wichita, Kans.
- Christensen, Henry C.,
130 N. Wells st., Chicago, Ill.
- Christian, Forest D.,
N. E. Cor. Ohio ave. and Poplar st., Sidney, Ohio.
- Chronik, Edward F.,
819 E. 163rd st., New York, N. Y.
- Chwatal, John J.,
2756 N. 22nd st., Chicago, Ill.
- Clafflin, Walter A.,
North Ferrisburg, Vt.
- Claffin, Albert Whitman,
70 S. Main st., Providence, R. I.
- Clancy, William J.,
657 First st., LaSalle, Ill.
- Clapp, Lowell T.,
59 Evans Road, Brookline, Mass.
- Clark, Albert H., Ph.G.,
701 S. Wood st., Chicago, Ill.
- Clark, Alfred William,
801 Santa Fe Drive, Denver, Colo.
- Clark, Ira B.,
5th and Woodland sts., Nashville, Tenn.
- Clark, Willis Anthony,
Remlig, Texas.
- Clarke, Louis G., Ph.G.,
Alder st. and West Park, Portland, Ore.
- Clarke, Stanley C.,
c. Standard Lab., 2626 Shields Ave., Chicago, Ill.
- Claus, Otto F., M.D.,
1406 St. Louis ave., St. Louis, Mo.
- Clay, Andrew W.,
Grygla, Minn.
- Clay, Cassius Lovelace,
203 New Court Bldg., Royal st., New Orleans, La.
- Claydon, P. H.,
St. James Medical Block, Red Wing, Minn.
- Clayton, Abraham T.,
Box 266, Ogontz, Pa.
- Clayton, Chas. J.,
1775 Humboldt st., Denver, Colo.
- Cliffe, Wm. L.,
2778 Kensington ave., Phila., Pa.
- Clough, Charles Isaac,
Tillamook, Oregon.
- Clower, Joseph B.,
Woodstock, Va.
- Coad, Wm. A.,
Hull, Iowa.

- Coblentz, Virgil,
 Chemists' Club, 52 E. 41st st.,
 New York, N. Y.
 Coffee, Sidney J.,
 S. W. Cor. Higgins ave. & Front
 st., Missoula, Mont.
 Cohan, Jacob Joseph,
 53 Spring st., Boston, Mass.
 Cohen, Joseph,
 4201 Broadway, New York, N. Y.
 Colcleugh, Murray C.,
 652 Notre Dame, Winnipeg, Mani-
 toba.
 Cole, Bessie Olive (Miss),
 3618 Sycamore st., Baltimore, Md.
 Cole, John Northrup,
 U. S. Ambulance Service, Camp
 Crane, Allentown, Pa.
 Cole, Victor L.,
 22 E. Market st., Corning, N. Y.
 Coleman, Arno A.,
 c. Greenwood Drug Co., Green-
 wood, S. C.
 Coleman, Geo. E.,
 21 Aspinwall Road, Dorchester,
 Centre, Mass.
 Coleman, John,
 c. Coleman Laboratory, City
 Bank Bldg., Wheeling, W. Va.
 Coll, Paula,
 Compostela, No. 170, Habana, Cuba.
 Collens, John W.,
 201 Deleard st., Monroe, La.
 Collier, Wm. K.,
 683 St. Peter st., St. Paul, Minn.
 Collins, Geo. Wm.,
 507 South Division st., Ann Ar-
 bor, Mich.
 Colson, Henry C., Jr.,
 2809 Mt. Holly st., Baltimore, Md.
 Colton, Edward T.,
 Cor. Pine and Somerset sts.,
 Providence, R. I.
 Combs, Delta E.,
 948-58 Wolfram st., Chicago, Ill.
 Condra, James O'Brien,
 148 W. Spring St., Titusville, Pa.
 Cone, Alfred I.,
 "Eldorado," 302 Central Park
 West, New York, N. Y.
 Conger, Fred A.,
 501 Selby ave., St. Paul, Minn.
 Conger, Horace Samuel,
 Ogilvie, Minn.
 Connell, Thomas A.,
 474 Main st., Winnipeg, Manitoba,
 Can.
 Conzet, Rufus W.,
 119 Cumberland st., Greenup, Ill.
 Cook, Alfred Page,
 342 Spring st., Portland, Me.
 Cook, E. Fullerton, Ph.D.,
 145 N. 10th st., Philadelphia, Pa.
 Cook, H. W.,
 3rd ave. & 74th st., Brooklyn, N. Y.
 Cook, Parker,
 c. Emerson Drug Co., Baltimore,
 Md.
 Cook, Roy Gould,
 61 Broadway, Fargo, N. D.
 Cooley, Albert D.,
 S. E. Cor. 27th & Lehigh ave.,
 Philadelphia, Pa.
 Cooper, Zada Mary (Miss), Ph.G.,
 124 Bloomington st., Iowa City, Ia.
 Cope, Frank H.,
 422 W. Dauphin st., Philadel-
 phia, Pa.
 Cordes, Henry,
 1301 Curtis st., Denver, Colo.
 CORNELL, EDWARD A., Ph.G.,
 1200 W. 4th st., Williamsport, Pa.
 Correa, John Francis, Jr.,
 21 Massachusetts ave., Boston,
 Mass.
 Corrigan, Dominick F.,
 1412 S. Main st., Fall River, Mass.
 Corrigan, Michael H.,
 1654 Westminster st., Providence,
 R. I.
 Costelo, David,
 918 Sixth ave., New York, N. Y.
 Cotanche, James Gilbert,
 Residence unknown.
 Cott, W. J.,
 62 W. Main st., Miners Mills, Pa.
 Coughlin, John,
 177 Water st., Augusta, Me.
 Coulson, James T.,
 c. Adolphus Pharmacy, Dallas, Tex.

- Coulter, George W.,
Franklin st., Clarksville, Tenn.
- Cousins, Walter Henry,
1314 Young st., Dallas, Tex.
- Coussens, Bettie P. (Miss),
5847 Delmar ave., St. Louis, Mo.
- Cox, Cyrus L.,
Science Hall, Valparaiso, Ind.
- Cox, Eugene H.,
10 Auburn ave., Atlanta, Ga.
- Cox, J. Harry,
New Lebanon, N. Y.
- Craig, Hugh,
Nyal Company, Detroit, Mich.
- Crain, George Lawrence,
U. S. Naval Training Station,
Great Lakes, Ill.
- Craine, Percy P.,
131 E. River st., Elyria, O.
- Crandall, Fred J.,
217 Lincoln st., Wilkes-Barre, Pa.
- Crane, Frank T., Ph.G.,
Machias, Me.
- Crane, Geo. W.,
421 Michigan ave., Detroit, Mich.
- Cravens, John Coldsmith, Jr.,
1127 E. Susquehanna ave., Philadelphia, Pa.
- Crawford, Dean Burton,
Pacific ave., Cor. Florida st., Atlantic City, N. J.
- Creagan, Wm. T.,
425 Court st., Brooklyn, N. Y.
- Creighton, Mary L. (Miss), Ph.C.,
611 Indiana ave., Urbana, Ill.
- Cromer, Andrew J.,
Residence unknown.
- Crooks, Harry W.,
169 Elwood ave., Newark, N. J.
- Crossman, Geo. A.,
Taunton, Mass.
- Crowe, Robert Latta,
879 Madison ave., Memphis, Tenn.
- Crowley, James Patrick,
800 W. 31st st., Chicago, Ill.
- CULBRETH, DAVID M. R.,
1307 N. Calverth st., Baltimore, Md.
- Culley, John, Ph.G.,
2479 Washington ave., Ogden, Utah.
- Cummings, William Leon,
117 Standart st., Syracuse, N. Y.
- Curd, Thomas N.,
800 N. 21st st., Richmond, Va.
- Currens, Turner Fee,
57-59 E. 11th st., New York, N. Y.
- Curtis, Morris E.,
3625 Detroit ave., Cleveland, Ohio.
- Daggett, V. Chapin,
314 N. 14th st., New York, N. Y.
- Dahl, Fred,
52 Shepard st., E. Orange, N. J.
- D'Alemberte, Herbert Harry,
121 S. Palafox st., Pensacola, Fla.
- Dalton, Ernest,
212 Exchange st., Chicopee, Mass.
- Damtoft, Knud J.,
326 State st., Bridgeport, Conn.
- Danek, John F.,
1228 Washington ave., N., Minneapolis, Minn.
- Daneker, Howard N.,
20 S. Mount st., Baltimore, Md.
- Danhauer, William Edward,
404 Frederica st., Owensboro, Ky.
- Dannettelle, Leonore K. (Mrs.),
601 W. 8th st., Cincinnati, Ohio.
- Darbaker, L. K., Ph.G., Ph.D.,
7025 Hamilton st., Pittsburgh, Pa.
- Darcy, John B.,
Residence Unknown.
- Darling, Oscar,
La. State Board of Health, New Orleans, La.
- Das, Premananda,
38 Raja Nobo Kissen st., Calcutta, India.
- Daste, Eugene H.,
2529 Bayou Road, New Orleans, La.
- Datz, Charles Percival,
3857 Vincennes ave., Chicago, Ill.
- Dauber, Curt Louis,
Mascoutah, Ill.
- Davies, Llewellyn P.,
Central City, Col.
- Davis, A. T.,
Warren, Ark.
- Davis, Brooke John,
Naval Hospital, St. Thomas, Virgin Island, U. S., U. S. N., R. F.

- Davis, Chas. L., Ph.G.,
63 State st., Newburyport, Mass.
- Davis, Ernest C., Ph.C.,
11 N. Howard st., Akron, O.
- Davis, Eugene M.,
317 Lion st., Dunkirk, N. Y.
- Davis, Frank J.,
Fayette, Iowa.
- Davis, John T., Jr.,
1232 Spring st., Quincy, Ill.
- Davis, May Agnes, Oc. (Mrs.),
19 Church st., White Plains, N. Y.
- Davis, Peter B.,
P. O. Box 473, Narragansett Pier,
R. I.
- Davis, W. B.,
535 Main st., Eldredsville, Pa.
- Davis, William E.,
Freedman's Hospital, Washing-
ton, D. C.
- Davy, Edward D.,
21 E. 12th ave., Columbus, Ohio.
- Dawe, William H.,
Residence Unknown.
- DAWSON, EDW. S., JR.,
125 S. Salina st., Syracuse, N. Y.
- DAWSON, JOHN HENRY, Ph.G.,
Glendora, Cal.
- Day, Elsie,
2030 Summer st., Lincoln, Neb.
- Day, Wm. B., Ph.G.,
701 S. Wood st., Chicago, Ill.
- Dayton, Walter H., Ph.G.,
Secy. Utah State Board Pharm.,
c. Dayton Drug Co., Salt Lake
City, Utah.
- Dean, Corliss Page, H. S., U. S. N.,
Hospital Corps, Training School,
Great Lakes, Ill.
- Dean, J. Atlee,
614 S. 48th st., Philadelphia, Pa.
- De Barr, Edwin,
122 S. University Blvd., Norman,
Okla.
- Decker, William Robert,
1607 Ridge ave., Philadelphia, Pa.
- De Courcy, Lydia,
N. E. Cor. 8th and Baymiller sts.,
Cincinnati, O.
- Dedic, Libbey (Miss),
3519 W. 26th st., Chicago, Ill.
- Dedrick, William F.,
308 Wall st., Kingston, New York.
- Deffa, George Caspar,
1719 Holland ave., New York, N. Y.
- De Forest, Wm. P.,
Springfield Gardens, N. Y.
- De France, Geo. W.,
161 Broad st., Grove City, Pa.
- Deibert, Thos. I.,
103 N. Center st., Pottsville, Pa.
- De Jonge, Cornelius,
584 E. 7th st., Brooklyn, N. Y.
- Delaney, Thos. F.,
207 Cabot st., Beverly, Mass.
- DeLang, Alfred,
Fourth ave. and Broadway, Cin-
cinnati, O.
- Delgado y Valdes, Emiliano,
Salud No. 60 bajos (Laboratorio),
Havana, Cuba.
- Delgado, Joila Estrella, M.D.,
San Nicholas, 245, Havana, Cuba.
- De Lorenzi, Albert,
Main and Ervay sts., Dallas, Tex.
- Delzell, J. T.,
Hersey, Mich.
- Demars, Gustave Jules,
Fertile, Minn.
- Demony, Marshall J.,
Mobile, Ala.
- Dennis, Edward G.,
Lieut. M. C., U. S. Navy, Naval
Training Station, Naval Operat-
ing Base, Hampton Roads,
Va.
- Dent, Gaylord Hess,
130 Fayette st., Morgantown,
W. Va.
- Dewender, Wm. H.,
167 Atlantic ave., Brooklyn, N. Y.
- Dewey, Albert H., Ph.G., B.S., M.S.,
R. F. D. No. 3, Vancouver, Wash.
- Diaz, Jose G.,
412 Principe Alfonso, Havana,
Cuba.
- Dickhut, Lawrence A., Ph.G.,
1001 N. 5th st., Quincy, Ill.

- Dickson, Fred Wm.,
4314 Springdale ave., West Forest
Park, Baltimore Co., Md.
- Diehl, August,
644 Bedford ave., Brooklyn, N. Y.
- Diekman, Clara A. (Mrs.),
115 W. 68th st., New York, N. Y.
- Diekman, George C.,
115 W. 68th st., New York, N. Y.
- Dill, Charles Thomas,
849 St. Nicholas ave., New York,
N. Y.
- Dillemuth, Frederick J., M.D.,
411 E. 153rd st., New York, N. Y.
- Dillenback, Garrett V.,
111 Delaware st., Albany, N. Y.
- Dilly, Oscar C.,
104 W. Chestnut st., Louisville, Ky.
- Dimmitt, Addison,
c. Newman Drug Co., 4th and
Chestnut Sts., Louisville, Ky.
- Dimond, Harry J.,
330 Connecticut st., Buffalo, N. Y.
- Diner, Jacob, Ph.G., M.D.,
316 W. 84th st., New York, N. Y.
- Dinkler, Frank A.,
Hennessey, Okla.
- Dinsel, Howard,
32 Main st., Kingston, Pa.
- Disbrow, William Stephen, M.D.,
151 Orchard st., Newark, N. J.
- Dissosway, Thurston N., Ph.C.,
426 E. 4th st., Brooklyn, N. Y.
- Dittmeyer, Walter E., P.D.,
Harper's Ferry, W. Va.
- Dodds, Frederick Clinton,
Dept. of Registration and Educa-
tion, State Capitol Bldg.,
Springfield, Ill.
- Dodds, Richard N.,
5th and Monroe sts., Springfield, Ill.
- Doden, Herbert F.,
321 N. Johnson st., Iowa City, Ia.
- Doden, J. R.,
c. E. Jerico, Moline, Ill.
- Dodge, Francis D.,
69 ave. A, Bayonne, N. J.
- Doerr, Louis,
94 S. 1st st., San Jose, Calif.
- Dohme, Alfred R. L.,
Pratt and Howard sts., Baltimore,
Md.
- Doliber, Franklin W.,
261 Franklin st., Boston, Mass.
- Donald, Lee Otis,
500 North Ewing St., Dallas
Texas.
- Donges, Wm. H.,
628 S. Detroit st., Xenia, O.
- Doniger, Simon,
Residence Unknown.
- Donnet, John Smith,
1335 N. Caroline st., Baltimore,
Md.
- Dooley, Daniel B.,
758 Adams st., N. E., Minne-
apolis, Minn.
- Doolittle, Roscoe E., B.S.,
805 Michigan ave., Evanston, Ill.
- Dore, Cornelius Wm.,
119 Martin ave., San Jose, Calif.
- Dorfman, Rudolph K.,
480 N. Orianna st., Philadelphia,
Pa.
- Dorsey, Maurice Edward,
304 S. Main st., Ottawa, Kans.
- Dort, Edw. H.,
Auburn, Neb.
- Doty, Wirt P.,
1913 Woodward ave., Detroit,
Mich.
- Douglas, Matthew H.,
488 Lincoln st., Detroit, Mich.
- Douglass, Brandegee, H. S., U. S. N.,
U. S. S. Scorpion,
c. P. M., New York, N. Y.
- Dow, John P.,
Lafayette, Colo.
- Downing, Benjamin F.,
42 Broadway, Newport, R. I.
- Downs, Bertis E.,
Welch, W. Va.
- Doyle, Joseph J.,
Castle Shannon, Pa.
- Doyle, Robert A.,
East Prairie, Mo.
- Draper, Thomas J.,
423 Cherry st., Helena, Ark.

- Drapewski, B.,
102 E. Northampton st., Wilkes-Barre, Pa.
- Dreiss, Herman E. F., Ph.G.,
119 Alamo Plazo, San Antonio, Tex.
- Dreyer, John D. F.,
41 John st., New York, N. Y.
- Driscoll, Thomas J.,
Fallkill Bldg., Main and Washington sts., Poughkeepsie, N. Y.
- Druehl, Amanda Stahl,
623 Alaska st., Chicago, Ill.
- Drugoncin, Nicholas,
32 Adams ave., W., Detroit, Mich.
- DuBors, Wm. L.,
379 Main st., Catskill, N. Y.
- Dubsky, Frank J.,
1834 W. 47th st., Chicago, Ill.
- Dubsky, Joseph E.,
1901 W. 51st st., Chicago, Ill.
- Duerfeldt, Henry George,
Main and Washington sts., Spokane, Wash.
- Duering, Henry C.,
Box 735, Lubbock, Tex.
- Duerr, Geo. J.,
678 Seneca ave., Brooklyn, N. Y.
- Dukelow, Richard T.,
Gilbert, Minn.
- Dulaney, Joseph F., P.D.,
Box 60, McKinney, Tex.
- DuMez, Andrew Grover,
25th and 3rd st., Hygienic Lab., Washington, D. C.
- Dunbar, Eugene A.,
U. S. S. Missouri, c. Postmaster, New York.
- Duncan, C. A.,
Baylor University, Coll. of Medicine, Dallas, Texas.
- Duncan, Wm. D.,
717 LaSalle st., Ottawa, Ill.
- Dunn, Mrs. John A.,
329 Stratford Road, Brooklyn, N. Y.
- Dunning, Henry A. B., Phar.D.,
713 Lennox st., Baltimore, Md.
- Dunning, L. T.,
8th Phillips ave., Sioux Falls, S. D.
- Dupaul, Armand Merrill,
Hamilton st., Southbridge, Mass.
- Dupree, George,
Sunbury, Pa.
- Durbin, George J.,
139 E. Main st., Plymouth, Pa.
- Durbin, W. S.,
805 Wyoming ave., Dorranceton, Pa.
- Dussault, Arthur,
268 Lisbon st., Lewiston, Me.
- Duvoisin, Agnes (Miss),
Baltimore ave. and Maple Terrace, Clifton Heights, Pa.
- Dwyer, Frank B.,
1320 Washington ave., Houston, Tex.
- Dyche, Wm. E.,
Texline, Tex.
- Dye, Clair Albert,
Ohio State Univ., Columbus, O.
- Dyer, Nicholas E.,
981a Tremont st., Boston, Mass.
- Dyna, Carl Frederik Julius, Ph.G.,
State Hospital, Patton, Cal.
- Dyniewicz, Hattie Adela,
1535 N. Hamlin ave., Chicago, Ill.
- Dyniewicz, Josephine Marion,
1535 N. Hamlin ave., Chicago, Ill.
- Earnest, Julius Fischer,
501 14th st., Denver, Colo.
- Easley, H. Francis,
4701 5th ave., Pittsburgh, Pa.
- Eastman, Welcome B.,
36-38 Eastern ave., St. Johnsbury, Vt.
- Eaton, Elgar Otis,
972 Sutter st., San Francisco, Calif.
- EBERBACH, OTTMAR,
25 S. Main st., Ann Arbor, Mich.
- Eberhardt, Ernest G., Ph.G.,
122 N. Arsenal ave., Indianapolis, Ind.
- Eberle, A. Ralph,
27th and Locust sts., Milwaukee, Wis.
- Eberle, Eugene G., Ph.M.,
Philadelphia Drug Exchange, Bourse Bldg., Philadelphia, Pa.
- Eberle, Herman T.,
204 Main st., Watertown, Wis.

- Eberly, Karl K.,
1700 Mt. Vernon St., Philadelphia,
Pa.
- Eberly, Ralph Milton,
27 N. Broadway, Aurora, Ill.
- Ebner, Frank Gannon,
442 St. Clair ave., Detroit, Mich.
- Eccles, Robert G., M.D.,
681 10th st., Brooklyn, N. Y.
- Echols, Robert Templeton,
9635 Forest ave., Chicago, Ill.
- Eckbert, Charles Ryan,
407 N. Grant ave., Kittanning, Pa.
- Eckford, Joseph W.,
Com. st., Aberdeen, Monroe Co.,
Miss.
- Eckler, Chas. R.,
335 Northern ave., Indianapolis, Ind.
- Eckstein, Sol. A.,
112 Wisconsin st., Milwaukee, Wis.
- Eddy, Clyde L.,
France.
- Eddy, Wynn L.,
Brigham Boxelder Co., Utah.
- Edelstein, Irving A.,
1728 Crotona Park, East, New York.
- Edmonds, B. P.,
70 Washington Blvd., Detroit, Mich.
- Edwards, A. H.,
291 Hughes st., Haltby, Pa.
- Edwards, William,
390 S. River st., Wilkes-Barre, Pa.
- Ehman, Jos. W.,
145 North 10th st., Philadelphia, Pa.
- Ehmann, Karl Francis,
U. S. A. General Hospital No. 31,
Building, No. 17, Carlisle, Pa.
- Eichenberger, William Samuel,
1016 N. Adams st., Peoria, Ill.
- Eichler, Henry,
N. E. Cor. 10th & Madison ave.,
Covington, Ky.
- Eichler, Philip, M.D.,
1787 Washington ave., Bronx,
New York, N. Y.
- Eichold, Bernard H.,
c. Mobile Drug Co., Mobile, Ala.
- Eidson, Frank Vinton,
H. A. 2nd Class Navy Yard, Naval
Dispensary, Charleston, S. C.
- Eisele, Martin A.,
310 Central ave., Hot Springs, Ark.
- Elam, John Thos.,
110 Ingram st., Henderson, Ky.
- Elden, Clarence Arthur,
133 W. Delevan ave., Buffalo,
N. Y.
- Eldred, Frank R.,
3325 Kenwood ave., Indianapolis,
Ind.
- Eleazar, E.,
Kaplon, La.
- Elfstrand, Wilhelm,
Lindstrom, Minn.
- Elisburg, Louis A.,
6260 Champlain ave., Chicago, Ill.
- Elliott, Chas. S.,
Captain, Sanitary Corps U. S. A.
Base Hospital, Camp Grant,
Rockford, Ill.
- Elliott, Fay Harold,
Box 445, Groveton, N. H.
- Elliott, Victor Alfred,
2908 Arthington st., Chicago, Ill.
- Ellis, Leon Clifton,
2 Market st., Lynn, Mass.
- Ellyson, G.,
Standard Chemical Co., Des
Moines, Ia.
- Elmer, Oscar Baker,
540 Magazine st., New Orleans, La.
- Elson, John R.,
1025 Chas. st., Wellsburg, W. Va.
- Ely, Ernest S.,
North Chestnut st., Barnesville, O.
- Emanuel, Julia Esther (Miss),
201 W. Berry st., Ft. Wayne, Ind.
- EMANUEL, LOUIS,
2nd ave. & Grant st., Pittsburgh,
Pa.
- Emerson, Herman L.,
311 Main st., Stoneham, Mass.
- Emery, Chas. Wm., Jr.,
4216a Dewey ave., St. Louis, Mo.
- Engebretson, Elmer,
Devil's Lake, N. D.
- Engelhard, George P.,
536 S. Clark st., Chicago, Ill.
- Engelhardt, Hermann,
2912 Garrison ave., Baltimore, Md.

- England, Joseph W.,
 415 N. 33rd st., Philadelphia, Pa.
 Engle, Wilbur Dwight,
 2233 S. Columbine st., Denver,
 Colo.
 Englert, William Robert,
 407 Railroad st., Elko, Nev.
 Engstrom, Ernst O., Ph.G.,
 251 North st., Pittsfield, Mass.
 Eolis, Bernard,
 2403 Walton ave., New York, N. Y.
 Erb, Olin,
 Absarokee, Mont.
 Erhart, Wm. H.,
 81 Maiden Lane, New York, N. Y.
 Erkel, Arthur Geo., Ph.C.,
 1228 Second st., N. E., Minne-
 apolis, Minn.
 Eskin, Sarah,
 1517 N. 8th st., Philadelphia, Pa.
 Estabrook, Henry Arthur,
 Cor. Main and Pritchard sts.,
 Fitchburg, Mass.
 Estes, Vernon Wilson,
 Orlando, Fla.
 Etler, Robert B.,
 1923 Adams st., Indianapolis, Ind.
 Etzel, John L.,
 Cerro Gordo, Clear Lake, Ia.
 Evans, Geo. B.,
 1106 Chestnut st., Philadelphia,
 Pa.
 Evans, Samuel Morgan,
 408 Luzerne ave., W. Pittston, Pa.
 Evans, Thos. J.,
 79 Center ave., Plymouth, Pa.
 Evans, W. E.,
 1205 Wyoming ave., Forty-Fort, Pa.
 Ewe, George Elwood,
 353 E. Walnut Lane, Germantown,
 Philadelphia, Pa.
 Ewing, Clare O.,
 Bureau of Chemistry, Washing-
 ton, D. C.
 Ewing, Edgar E.,
 c. Base Hospital, Camp Pike, Ark.
 Ewing, Samuel E.,
 Creston, Neb.
 FAIRCHILD, BENJ. T.,
 76 Laight st., New York, N. Y.
- Fairchild, Samuel W.,
 Wash'n & Laight sts., New York,
 N. Y.
 Falk, John C., Ph.G., M.D.,
 4568 Page Blvd., St. Louis, Mo.
 Falkenhainer, Albert,
 Algona, Ia.
 Falkenhainer, Charles,
 Booth & Julien aves., Dubuque, Ia.
 Fantus, Bernard, M.D.,
 719 S. Ashland Blvd., Chicago, Ill.
 Farlow, John H.,
 Berlin, Md.
 Farquhar, William,
 S. W. Cor. Public Square, Bucy-
 rus, O.
 Farwell, Oliver A.,
 c. Parke, Davis & Co., Detroit,
 Mich.
 Faser, Henry M.,
 University, Miss.
 Fasnacht, Allen Hornberger,
 1321 Ruby St., Philadelphia, Pa.
 Faulkner, Ellis E.,
 Delton, Mich.
 Faulkner, John William,
 5224 S. Birmingham st., Tacoma,
 Wash.
 Faundo, Eduardo Garcia,
 529 Cerro st., Havana, Cuba.
 Fechter, Arthur E.,
 521 N. Clark st., Chicago, Ill.
 Federmann, Wm. M.,
 1100 Grand ave., Kansas City, Mo.
 Feindt, Louis E.,
 51 S. Orange ave., South Orange,
 N. J.
 Feldman, Jacob,
 321 Pleasant ave., New York, N. Y.
 Feller, Leo,
 685 Belmont ave., Brooklyn, N. Y.
 Fenger, Frederic,
 c. Armour & Co., U. S. Yards,
 Chicago, Ill.
 Fennel, Chas. T. P., Ph.G., Phar.D.,
 Cincinnati Coll. of Pharm., 614
 W. Court st., Cincinnati, O.
 Ferguson, James A.,
 S. E. Cor. Howard & Thompson
 sts., Philadelphia, Pa.

- Fernandez y Valdez, Jose E.,
Santa Clara, Cuba.
- Fesler, James,
Residence Unknown.
- Fiarilla, Julius,
304 W. 149th st., New York, N. Y.
- Fields, J. Larkin,
110 E. Douglas st., Wichita, Kans.
- Fiero, Wm. W.,
417 Woodward ave., Detroit, Mich.
- Filar, Louis L.,
809 N. Washington st., Wilkes-
Barre, Pa.
- Filer, Samuel S.,
c. Fogarty & Co., Key West, Fla.
- Fine, Eben Givens,
Box 466, Boulder, Colo.
- Fink, Daniel J.,
Holdredge, Neb.
- Finneran, James F.,
100 Tremont st., Boston, Mass.
- Finney, Burt,
201 4th st., Bismarck, N. D.
- Fischelis, Robert P., Ph.G., Ph.C.,
B.Sc.,
828 N. 5th st., Philadelphia, Pa.
- Fischer, Albert Martin,
523 E. Houston st., San Antonio,
Tex.
- Fischer, Charles F.,
262 Cornelia st., Brooklyn, N. Y.
- Fischer, Ray O.,
Jefferson, Wis.
- Fischer, Richard,
Univ. of Wisconsin, Madison, Wis.
- Fischer, Geo. W.,
De Land, Fla.
- Fischer, Henry, M. D.,
2345 E. Dauphin st., Philadelphia,
Pa.
- FISH, CHARLES F.,
348 Broadway, Saratoga Springs,
N. Y.
- Fish, Erwin L.,
Buffalo State Hospital, Buffalo,
N. Y.
- Fisk, Frank Byron,
4926 Park ave., Indianapolis, Ind.
- Fitzkee, Hastings,
603 Locust st., Wrightsville, Pa.
- Fitz-Simon, Vincent Joseph,
829 N. Main st., Brockton, Mass.
- Flake, William Lee,
Residence Unknown.
- Flandermeyer, August L., Ph.G.,
3501 Library ave., Cleveland, O.
- Fleishman, Israel,
933 E. 181st st., New York, N. Y.
- Flemer, Lewis,
701 Maryland ave., N. E., Wash-
ington, D. C.
- Fletcher, David M.,
3993 Washington st., San Fran-
cisco, Cal.
- Fletcher, Joel Morgan,
101 N. Lancaster st., Dallas, Tex.
- Flint, John H.,
2489 Howard st., San Francisco, Cal.
- Flint, Wm. S.,
56 Franklin st., Worcester, Mass.
- Flomenbaum, Isadore,
Residence Unknown.
- Foertmeyer, Charles George, Dr.,
600 Central ave., Cincinnati, O.
- Follensby, Edna Mildred (Miss),
Box 288, Westboro, Mass.
- Fong, Job,
c. Chung Mei Drug Co., Canton,
So. China.
- Fonteyne, Gustave J.,
Sanitary Corps, U. S. General
Hospital, New Haven, Conn.
- Foran, Ralph Richard,
145 N. 10th st., Philadelphia, Pa.
- Ford, Chas. M.,
P. O. Box 114, Cambridge, Mass.
- Ford, Myron Nile,
State House, Columbus, O.
- Formhals, Wallace Joseph,
730 W. Madison st., Ottawa, Ill.
- Fortin, Emile A., M.D.,
46 Alfred st., Biddleford, Me.
- Foss, Palmer L.,
Page, N. Dakota.
- Foster, John B.,
Roseville and 7th ave., Newark,
N. J.
- Fouch, Wm. M.,
Charles st. and North ave., Balti-
more, Md.

- FOUGERA, EDMOND C. H.
309 8th st., Brooklyn, N. Y.
- FOULKE, JAMES,
329 Arlington ave., Jersey City,
N. J.
- Foulser, Stanley William,
40 Ashford st., Allston, Mass.
- Fowler, George Ross,
Hankinson, N. D.
- Fox, Edward,
329 E. 152nd st., New York, N. Y.
- Fox, Willard M.,
9702 Cedar ave., Cleveland, O.
- Frailey, Wm. O.,
57 N. Queen st., Lancaster, Pa.
- Frames, Jno. F., Ph.G.,
601 N. Gay st., Baltimore, Md.
- France, Thomas J.,
42 Hart st., Brooklyn, N. Y.
- Francis, John M., B.S., M.A.,
240 Seyburn ave., Detroit, Mich.
- Frank, August, Ph.G.,
Box 44, "Town of Union," Wee-
hawken P. O., N. J.
- Frank, Henry,
2071 Vyse ave., Bronx, N. Y.
- Frank, Louis,
Wilkes-Barre, Pa.
- Frankfurter, F. S.,
807 Courtland ave., New York,
N. Y.
- Frase, Karl W.,
2118 S. Halsted st., Chicago, Ill.
- FRASER, HORATIO N., PhG., Ph.M.,
M.D.,
583 5th ave., New York, N. Y.
- Frauenhoff, Frederick L., Ph.G.,*
136 Hinman st., Aurora, Ill.
- Freericks, Frank H., Ph.G., LL.B.,
1004 Mercantile Lib. Bldg., Cin-
cinnati, O.
- Freiberg, Ralph,
3501 Reading Road, Cincinnati, O.
- French, Adelbert P.,
2782 Woodward ave., Highland
Park, Mich.
- French, Harry B.,
429 Arch st., Philadelphia, Pa.
- French, Howard B.,
410 Callowhill st., Philadelphia, Pa.
- French, Leon Hermann, Lt.,
Medical Corps, U. S. Navy, U. S.
Navy Base Hospital No. 1;
U. S. Navy Base No. 7, c.
Postmaster New York, N. Y.
- Freund, Paul,
309 Chartres st., New Orleans, La.
- Frick, Robert J.,
634 W. Main st., Louisville, Ky.
- Fricke, Frederick Geo.,
Union Block, Plattsmouth, Neb.
- Fricke, Fred H.,
3218 Hebert st., St. Louis, Mo.
- Fried, Leopold H.,
Larch ave., Cor. Main st., Bogota,
N. J.
- Friedenburg, Maximillian W.,
812 Main st., Winfield, Kans.
- Friedgen, Charles,
1220 Amsterdam ave., New York,
N. Y.
- Friedman, Isaac,
53 Halsey st., Newark, N. J.
- Friedman, Louis,
668 Teuton ave., Bronx, N. Y.
- Friedman, William Leonard,
1833 N. 20th st., Philadelphia, Pa.
- Fritschel, Arno William,
5740 S. Carpenter st., Chicago, Ill.
- Frosst, Charles E.,
17 Forden ave., Westmount,
Prov. Quebec.
- Frost, Wm. A., Ph.G.,
Selby and Western aves., St. Paul,
Minn.
- Fruchtman, Samuel R.,
Main and Church sts., Milburn,
N. J.
- Frutchey, Geo. W.,
Box 25, Westfield, N. J.
- Fry, Daniel Joshua,
280 N. Commercial st., Salem, Ore.
- Fry, Herman,
5050 Kenmore ave., Chicago, Ill.
- Fry, Narcys Geo.,
421 W. North ave., Chicago, Ill.
- FRYE, GEO. C.,
320 Congress st., Portland, Me.
- Fuhrman, Cyrus Jacob,
Coquille, Ore.

- Fuller, Henry Corbin,
Institute of Industrial Research,
19th and B sts., N. W., Wash-
ington, D. C.
- Fuller, James Cook,
924 Baltimore ave., Kansas City,
Mo.
- FULLER, OLIVER F.,
540 W. Randolph st., Chicago, Ill.
- Gaddess, John,
20 E. First st., Oil City, Pa.
- Gaddy, Robert Litson,
Woodruff, S. C.
- Gaesser, Theobald T., Ph.G.,
Troy, Ind.
- Gaetz, Halley Hamilton,
c. Univ. of Alberta, Edmonton
South, Prov. of Alberta, Can.
- Gahn, Henry,
Marine Hospital, Wilmington, N. C.
- Gallagher, C. J.,
328 Scott st., Wilkes-Barre, Pa.
- Galloway, J. B.,
1625 Van Buren st., Chicago, Ill.
- Gamble, Stewart,
901 Hennepin ave., Minneapolis,
Minn.
- Gammon, Irving P.,
1363 Beacon st., Brookline, Mass.
- Gane, Eustace H.,
95 Fulton st., New York, N. Y.
- Gannon, Edward P.,
65 Prospect st., Wilkes-Barre, Pa.
- Gano, Wm. H., Ph.G.,
Hampton Court, 207 N. 35th st.,
Philadelphia, Pa.
- Gardier, Louis,
317 South Main ave., Scranton, Pa.
- Gardner, Alex, Ph.G.,
69 Myrtle ave., Brooklyn, N. Y.
- Garrels, Charles,
1110 Fairmont st., Washington,
D. C.
- Garrigo, Antonia M. (Miss),
1 Altarriba st., Havana, Cuba.
- Garrison, Dayton B., Jr., Ph.G.,
Connell, Wash.
- Garvey, James A.,
805 97th st., Woodhaven, N. Y.
- Garvin, William S.,
47 Summit ave., Webster Grove, Mo.
- Gathercoal, Edmund N.,
701 S. Wood st., Chicago, Ill.
- Gavalda, y Milanes Antonio,
88 Marti, Artemisa, Cuba.
- Gayle, John W.,
Ann st., and Broadway, Frankfort,
Ky.
- Gazzolo, Frank Henry,
119-123 S. Green st., Chicago, Ill.
- Geddes, Lillian M. (Mrs.),
1377a Commonwealth ave., All-
ston (Boston), Mass.
- Geimer, Frederick M.,
Maplewood, N. J.
- Geisenberger, Abe. H., Jr.,
1325 25th st., Galveston, Texas.
- Geisler, Joseph F.,
6 Harrison st., New York, N. Y.
- Gerald, Herbert F., M.D.,
2441 Brown st., Omaha, Neb.
- Gerhard, John,
1215 West Allegheny ave., Phila-
delphia, Pa.
- GERING, HENRY R.,
701-703 S. 13th st., Omaha, Neb.
- Gershenfeld, Louis,
281 S. 63rd st., Philadelphia, Pa.
- GESSNER, EMIL A.,
862 Chapel st., New Haven, Conn.
- Gibbons, George, Jr.,
125 Grove st., Wilkes-Barre, Pa.
- Gibney, E. Paul,
146 W. Kinzie st., Chicago, Ill.
- Gibson, Frank L.,
U. S. Marine Hospital, San Fran-
cisco, Calif.
- Gidley, Wm. F., Ph.C., B.S.,
250 Hillside ave., Jamaica, Long
Island, N. Y.
- Gietner, Chas., Ph.G.,
2910 S. Grand ave., St. Louis, Mo.
- Gifford, Edward Rudy,
87 Vernon st., Boston, Mass.
- Gift, Wendell J.,
Converse, Ind.
- Gilbert, Cyrus Thurston,
Noroton, Conn.

- Gilleland, John Roy,
59th & Water sts., Pittsburgh, Pa.
- Gillespie, H. L.,
407 N. Main st., Wilkes-Barre, Pa.
- Gilman, Elbridge W.,
Main st., Marshfield, Vt.
- Gilmore, Mildred Lillian,
21 Webster st., Allston, Mass.
- Gilpin, Henry B.,
300-302 W. Lombard st., Baltimore, Md.
- Ginliani, Anthony,
3542 Holland ave., New York, N. Y.
- Ginsberg, Julius,
226 9th ave., Cor. 24th, New York, N. Y.
- Ginsburg, Miss Sylvia,
908 S. Ashland st., Chicago, Ill.
- Giorgianni, Salvatore,
2272 Pacific st., Brooklyn, N. Y.
- Githens, Thos. S.,
66th st., Rockefeller Institute, New York, N. Y.
- Giusti, Dante A.,
803 Wylie ave., Pittsburgh, Pa.
- Givens, Ed. M.,
34 Marcy st., Freehold, N. J.
- Gladding, Curtis P.,
1203 Main st., Hartford, Conn.
- Glass, Raphael,
35 Poplar st., Philadelphia, Pa.
- Gleason, David J.,
United States Marine Quarantine Sta., Galveston, Tex.
- Gleason, Patrick S.,
Pine & Elm sts., Waltham, Mass.
- Glendening, Harold,
1 Main st., Norwalk, Conn.
- Glissman, Hugo R.,
Doon, Iowa.
- Glover, Clifford C.,
1108 Prospect, Ann Arbor, Mich.
- Glover, Wm. H., Ph.G.,
299 Essex st., Lawrence, Mass.
- Godbold, Fabius C.,
5601 Rosemary Place, New Orleans, La.
- GODDING, JOHN G., Ph.G.,
278 Dartmouth st., Boston, Mass.
- Godlewski, Charles F.,
2310 W. 3rd st., Chester, Pa.
- Goeckel, Henry Jos.,
N. Lehigh ave. & Mansion Terrace, Cranford, N. J.
- Goheen, Ira Lee,
Sgt. 1st Cl., Field Hospital 139, 110 Sanitary Train, American E. F.
- Gold, Maur George,
1902 South 5th St., Philadelphia, Pa.
- Goldberg, Philip,
804 E. 178th st., New York, N. Y.
- Goldner, John E.,
1854 Central ave., Minneapolis, Minn.
- Goldsborough, Chas. H.,
Box 267, Culpepper, Va.
- Goldwag, Joseph Samuel,
1981 Amsterdam ave., New York, N. Y.
- Goltz, Carl Julius,
P. O. Box 1273, Havana, Cuba.
- Gonzales, y Jones Jose A.,
Apartado 166 Barranquilla, Columbia, S. A.
- Gonzales, Teodoro M., Gutierrez,
Barranquilla, Columbia, S. A., Apartado 166.
- Good, Jacob Edison,
Fourth & Bridge sts., New Cumberland, Pa.
- GOOD, JAMES M.,
2601 Olive st., St. Louis, Mo.
- Goodale, Martin H.,
9 E. Main st., Battle Creek, Mich.
- Goodhart, Brua Clifford,
239 S. 11th st., Locust, Philadelphia, Pa.
- Goodman, Joseph,
Broadway & Baxter ave., Elmhurst, L. I., N. Y.
- Goodman, Samuel Morris,
131 Spruce st., Newark, N. J.
- Goodrich, Forest Jackson,
112 N. 18th st., Philadelphia, Pa.
- Goodwin, Howard,
261 Franklin st., Boston, Mass.
- Goodyear, Wilbur B.,
1901 Derry st., Harrisburg, Pa.

- Goodykoontz, Chas. H.,
Bluefield, W. Va.
- Gordin, Henry M.,
2431 S. Dearborn st., Chicago, Ill.
- Gordon, Jean (Miss),
551 Grant Pl., Chicago, Ill.
- Gorenflo, Oscar W.,
Washington Arcade, Detroit,
Mich.
- GORGAS, GEO. A.,
16 N. 3rd st., Harrisburg, Pa.
- Gorman, Charles F.,
c. The Newton Drug Co., Hart-
ford, Conn.
- Grabber, Howard T.,
470 Atkinson ave., Detroit, Mich.
- Grace, Robert F.,
331 Chartres st., New Orleans,
La.
- Grace, Wm. D.,
11 Market Square, Portsmouth,
N. H.
- Graham, Charles E.,
403 E. 8th st., Kansas City, Mo.
- Graham, Frank William,
518 N. S. Square, Carlinville, Ill.
- Graham, John Russell,
Box 245, Wheeling, W. Va.
- Graham, Willard,
35 Poplar st., Philadelphia, Pa.
- Gram, William J. B.,
400 Lake st., Oak Park, Ill.
- Grandy, Seth Parker,
76 S. Lake st., North East, Pa.
- Grasser, John J.,
1234 St. Andrew st., New Or-
leans, La.
- Graw, Paul,
531 E. Water st., Milwaukee, Wis.
- Gray, Harold,
2813 Ruckle st., Indianapolis, Ind.
- Gray, Margaret M. (Mrs.),
4151 Gladys ave., Chicago, Ill.
- Gray, Minot E.,
23 N. Main st., Wilkes-Barre, Pa.
- Gray, Wm.,
1753 W. Congress st., Chicago, Ill.
- Gratziani, Attilio,
Field Hosp. 302 San. Train,
Camp Upton, N. Y.
- Green, Benj.,
1 Market Square, Portsmouth,
N. H.
- Green, Franklin T.,
500 Devisadero st., San Fran-
cisco, Cal.
- Green, James H.,
16th & Howard sts., Omaha, Neb.
- Green, Robert L.,
Stu. Off. Univ. N. D., Notre
Dame, Ind.
- Green, Samuel,
6140 Lansdowne ave., Philadelphia,
Pa.
- Green, W. V.,
125 Academy st., Wilkes-Barre, Pa.
- Greenbaum, Solomon,
66 Ave. D, New York, N. Y.
- Greenberg, Earl N.,
815 Logan ave., N., Minneapolis,
Minn.
- Greenberg, Joseph,
1047 Teller ave., New York, N. Y.
- Greenblatt, Benjamin,
209 S. Madison st., Iowa City, Ia.
- Greenstein, Norris,
201 E. Market st., Wilkes-Barre, Pa.
- Greenstone, Charles A.,
S. W. Cor. 7th & Poplar sts.,
Philadelphia, Pa.
- Gregg, Thos. D.,
1 Main st., Harrisburg, Ill.
- Gregory, H. T.,
340 Wyoming ave., Wyoming, Pa.
- Gregory, Willis G., Ph.G., M.D.,
125 Bedford ave., Buffalo, N. Y.
- Greule, Albert M.,
4th & Overton sts., Newport, Ky.
- Grewe, Louis F., Ph.G.,
Grand & Russell aves., St. Louis,
Mo.
- Greyer, Chas. P.,
Morgantown, N. C.
- GREYER, JULIUS,
1926 Race st., Cincinnati, O.
- Griesing, Howard William,
446 E. Broad st., Hazleton, Pa.
- Griffen, Truman,
2547 Hennepin ave., Minneapolis,
Minn.

- Griffin, Lyman W.,
63 Warren ave., Boston, Mass.
- Griffith, Ivor,
39 S. 10th st., Philadelphia, Pa.
- Grobelewski, G.,
241 E. Main st., Plymouth, Pa.
- Grommet, Geo. H.,
2001 Jefferson ave., E., Detroit,
Mich.
- Gronau, Arthur P.,
Residence Unknown.
- Gross, E. Orville,
Elma, Ia.
- Grothe, Frank Louis,
1135 Spring st., Cincinnati, Ohio.
- Grover, Geo. E.,
146 Broadway, Somerville, Mass.
- Grund, Charles Hugo, Jr.,
3511 Archer ave., Chicago, Ill.
- Gschwender, Paul,
c. Highland Park Sta., Des
Moines, Ia.
- Gsell, Earl W.,
113 E. Cent. ave., Highland Park, Ill.
- Guenther, Harry F. J.,
6430 St. Clair St., Cleveland, Ohio.
- Guerin, James F.,
236 Front st., Worcester, Mass.
- Guerra, Alirio Diaz, M.D.,
29 Polhemus Place, Brooklyn, N. Y.
- Guerrero, Juan C.,
Encinal, Tex.
- Guest, Wilbert H.,
1158 Central ave., Los Angeles, Cal.
- Gundrum, Geo.,
329 W. Main st., Ionia, Mich.
- Gunn, George Baylies,
Main st., Uxbridge, Mass.
- Haack, Rudolph G.,
351 Alder st., Portland, Ore.
- Haarer, Oscar,
113 W. Liberty st., Ann Arbor, Mich.
- Haase, William Frederick, Jr.,
55 Hanson Place, Brooklyn, N. Y.
- Haering, Geo. V.,
570 W. Madison st., Chicago, Ill.
- Haeseler, Loren M.,
1959 W. Madison st., Chicago, Ill.
- Hagemann, Wm. H., Ph.G.,
1001 N. 5th st., Quincy, Ill.
- Hagemeister, Walter F.,
13800 St. Clair ave., Cleveland,
Ohio.
- Hagenow, Theodore Chas.,
1701 S. Grand ave., St. Louis, Mo.
- Hager, Max M.,
320 Hart st., Brooklyn, N. Y.
- Hahn, Chas. W. J. H.,
2109 E. Fair ave., St. Louis, Mo.
- Hahn, Edward T.,
1242 N. 53d st., Philadelphia, Pa.
- Hahn, Gustave,
Ft. Hancock, N. J.
- Hahn, Wm.,
105 Union st., Newton Center, Mass.
- Haight, A. C.,
124 Main ave., Luzerne, Pa.
- Haines, Drexel W.,
134 Douglas ave., Freeport, Ill.
- Halbkat, Franklin W.,
Webster, S. D.
- Hale, Leon P.,
703 Franklin st., Tampa, Fla.
- Hall, Edward J.,
138 Minerva ave., Jackson, Miss.
- Hall, George Chalmers,
1422 52nd st., Brooklyn, N. Y.
- Hall, Percy Newell,
22 Elm st., Westfield, Mass.
- Hall, Wm. A.,
156 Ferry st., Detroit, Mich.
- Hall, Wm. D.,
35th & Queen Lane, Falls of
Schuylkill, Philadelphia, Pa.
- Halloway, Robert R., B.Sc., Ph.D.,
5 Devonshire st., Carlisle, Eng.
- Hallenberg, Oscar,
66 Broadway, Fargo, N. D.
- Halstead, Alice L. (Mrs.), Ph.G.,
1101 E. Front st., Muscatine, Ia.
- Hamann, Wm. A.,
100 William st., New York, N. Y.
- Hamilton, Herbert C., Chem. Eng.,
c. Parke, Davis & Co., Detroit, Mich.
- Hamilton, Mary R. (Miss),
Pinney st., Rochester General
Hospital, Rochester, Pa.
- Hammar, Alrick, Ch. Phar., U. S. N.,
614 Ohio st., Vallejo, Cal.

- Hammett, Frank U.,
2630 Pine st., St. Louis, Mo.
- Hance, Anthony M.,
201 Walnut st., Philadelphia, Pa.
- Hancock, James E.,
521 W. Lombard st., Baltimore, Md.
- HANCOCK, JOHN F.,
521 W. Lombard st., Baltimore, Md.
- Handy, John Abner,
C. P. & P. Dept., Larkin Co.,
Buffalo, N. Y.
- Hankey, Wm. T.,
Box 409, Cleveland, O.
- Hankins, W. M.,
Daytona, Fla.
- Hannah, Malcolm E.,
18 S. Palafox st., Pensacola, Fla.
- Hansburg, Max,
489 3rd ave., New York, N. Y.
- Hapke, Paul,
U. S. Naval Hosp., Brooklyn, N. Y.
- Harben, Sam P.,
Richardson, Texas.
- Harbold, Curtis A.,
1820 Columbia ave., Philadelphia,
Pa.
- Hardigg, William L.,
812 2nd st., Evansville, Ind.
- HARDIN, JOHN H.,
126 S. Front st., Wilmington, N. C.
- Hargreaves, Chester Charles,
Apt. 505, 430 Mass. ave., In-
dianapolis, Ind.
- Harman, Harry M., M.D.,
Bridge st., Frenchtown, N. J.
- Harms, Herman,
135-141 State Capitol, Salt Lake
City, Utah.
- Harper, Grace Irene,
340 Hudson St., c. Burroughs,
Wellcome & Co., New York, N. Y.
- Harper, John,
311 Main st., Great Barrington,
Mass.
- Harrell, Eldridge Columbus,
Dallas, Texas.
- Harris, Harry L.,
100 Williams st., New York,
N. Y.
- Harris, Richard,
383 W. Main st., Plymouth, Pa.
- Harrison, George Waller,
Railway ave., Cypress River,
Manitoba.
- Harrison, Joseph Whipple Eugene,
21 N. 53rd st., Philadelphia, Pa.
- Hart, Fanchon,
115 W. 68th st., New York, N. Y.
- Harter, Isaac F., M.D.,
Stronghurst, Ill.
- Harting, Rudolph R.,
Short & Mill sts., Lexington, Ky.
- Hartman, Joseph E.,
115 W. McCarty st., Indianapolis,
Ind.
- Hartman, Stephen C.,
126 Gaylor ave., Plymouth, Pa.
- Hartwell, Geo. Henry,
815 Logan st., Minneapolis, Minn.
- Hartwig, Otto J.,
1950 Milwaukee ave., Chicago, Ill.
- Hartz, Wm. T.,
301 20th st., Rock Island, Ill.
- Haschenburger, Edmond O., Ph.G.,
1211 O st., Lincoln, Neb.
- Hatcher, Robert A.,
414 E. 26th st., New York, N. Y.
- Hatten, J. R.,
587 Main st., Edwardsville, Pa.
- Hatton, Ellmore W.,
134 N. High st., Columbus, O.
- Hauenstein, Armin Herrman,
414 S. Main st., Bluffton, Ohio.
- Hauenstein, Sidney,
Bluffton, O.
- Hauser, Charles A.,
811 Main st., Covington, Ky.
- Hausgen, Henry Otto,
Anchorage, Ky.
- Haussamen, Henry L., Ph.G.,
Grafton, N. D.
- Haussmann, Fred W.,
Cor. 6th and Girard ave., Phila-
delphia, Pa.
- Havenhill, L. D.,
1539 Vermont st., Lawrence, Kans.
- Hawkins, Frank,
Blair, Okla.

- Hawkins, John M.,
East Prairie, Mo.
- Hawley, Norma C.,
Butterworth Hospital, Grand
Rapids, Mich.
- Hawthorne, Herman F.,
2038 Mass. ave., Cambridge, Mass.
- Hay, Edw. A.,
439 Cumberland ave., Portland,
Me.
- HAYES, HORACE P.,
312 Elk st., Buffalo, N. Y.
- Haymaker, Frank B.,
316 Main st., Clarksburg, W. Va.
- HAYNES, DAVID O.,
3 Park Place, New York, N. Y.
- Haynes, Herbert,
159 Broadway, Providence, R. I.
- Hays, Francis B.,
Oxford, N. C.
- Hayward, Lawrence B.,
1091 2nd ave., Detroit, Mich.
- Haywood, George H.,
Osakis, Minn.
- Hazeldine, Earl L.,
Lead, S. D.
- Headen, Claude Thomas, Ph.C.,
201 Frederick st., San Francisco,
Cal.
- Hechler, Edw. H.,
3719 Broadway, Cleveland, O.
- Heckerman, Adam B.,
Port Royal (Juniata Co.), Pa.
- Heckler, Michael Schuster,
807 Cherry st., Vicksburg, Miss.
- Heden, Myrtle M.,
Conrad, Mont.
- Heebner, Chas. F.,
Ontario Coll. Ph., Toronto, Ont.,
Can.
- Heidenreich, Arthur C.,
903 7th st., Regent Apts., Des
Moines, Ia.
- Heim, William,
1001 James ave., Saginaw, Mich.
- Heimerzheim, Eugene,
567 Central ave., Brooklyn, N. Y.
- Heimovitch, Max,
1078 Stebbins ave., New York, N. Y.
- Hein, Henry F.,
601 Goliad st., San Antonio, Texas.
- Heinemann, Albert F.,
54 S. Washington st., Valparaiso,
Ind.
- Heinemann, Edwin,
1572 Elm st., Cincinnati, O.
- Heinritz, Lebrecht G.,
16 Washington ave., Holyoke, Mass.
- Heisler, John E.,
Centerville, S. D.
- Heister, Louis,
S. E. Cor. 7th & Elm sts., Cin-
cinnati, O.
- Heller, Charles T.,
484 Wabasha st., St. Paul, Minn.
- Heller, Theodore Rinehart,
1145 Freas ave., Berwick, Pa.
- Hellmuth, Joseph A.,
2148 N. Robey st., Chicago, Ill.
- Helmsderfer, John C.,
35 Louis Ave., Cincinnati, Ohio.
- Helwig, Raymond G.,
220 Falls Blvd., Martinsville, N. Y.
- HEMM, FRANCIS,
2108 Locust st., St. Louis, Mo.
- Henderson, Edward A.,
3600 Univ. ave., Los Angeles, Calif.
- Hendrickson, Raymond,
2100 Providence ave., Chester, Pa.
- Henning, Adolph,
137 Water st., New York, N. Y.
- Henry, Arthur M., B.S., 2nd Lieut.,
Tallahassee, Fla.
- Henry, Frank C.,
703 15th st., N. W., Washington,
D. C.
- Henry, Samuel C.,
c. N. A. R. D., 168 N. Michigan
Blvd., Chicago, Ill.
- Hensel, Samuel Theodore, Ph.G.,
315 Mercantile Bldg., Denver,
Colo.
- Hensge, William,
1880 Rosalind ave., Cleveland, O.
- Henwood, Earl C.,
c. Hazle Drug Co., Hazleton, Pa.
- HEPBURN, JOHN,
103 Main st., Flushing, N. Y.

- Herbert, L. Miner,
Worthington, Minn.
- Herbkersman, Alma F. (Miss),
6203 Broadway, Cleveland, Ohio.
- Hereth, Franklin S.,
c. E. R. Squibb & Sons, Wash-
ington & York sts., Brooklyn,
N. Y.
- Hermanek, Joseph C.,
4016 W. 26th st., Chicago, Ill.
- Hernandez y Cartaya, Julio,
125 Campanario, Havana, Cuba.
- Herpich, John L.,
166 E. Main st., Columbus, O.
- Herting, A. C.,
3504 Federal st., Camden, N. J.
- Herzog, Carl J.,
122 Hudson st., New York, N. Y.
- Hess, Paul L.,
3636 Harrison Blvd., Kansas
City, Mo.
- Hessler, Elmer H.,
4625 Camac st., Philadelphia, Pa.
- Heusler, Philip L.,
Emerson Dg. Co., Bromo-Seltzer
Tower Bldg., Baltimore, Md.
- Heuschling, Allen J.,
U. S. Embassy, London, Eng., c.
Navy Department.
- Hickerson, Wm. H.,
Warren, Huntington Co., Ind.
- Hicks, Henry T.,
327 Hillsboro st., Raleigh, N. C.
- Highley, L. E.,
Hot Springs, S. D.
- Hight, Macy S.,
1038 8th ave., Hickory, N. C.
- Hileman, Fred D.,
482 Carey ave., Wilkes-Barre, Pa.
- Hill, Homer L.,
Sutton, N. D.
- Hills, Daniel Henry,
Spring Lake Beach, N. J.
- Hilpert, Willis S.,
543 E. 34th st., Chicago, Ill.
- Hilterbrand, Enos Alexander,
4011 Colonial ave., Dallas, Tex.
- Hilton, Emily K. (Mrs.),
Socorro, N. Mex.
- HILTON, SAMUEL L., PHAR.D.,
1033 22d st., N. W., Washington,
D. C.
- Hindes, Joseph F.,
c. Emerson Drug Co., Baltimore,
Md.
- Hindman, Frances Edith, Ph.C., M.S.
(Miss),
University of Wash., Coll. of
Pharmacy, Seattle, Wash.
- Hines, Luke Carleton, Ph.D.,
104 Waldo ave., Jersey City, N. J.
- Hires, Charles E.,
206 S. 24th st., Philadelphia, Pa.
- Hires, Lewis Moore,
High & Union sts., Burlington,
N. J.
- Hirscher, Alfred Meade,
Janesville, Minn.
- Hitchcock, Chas. H.,
999 Beacon st., Brookline, Mass.
- Hoch, Quintus,
2429 Frankford ave., Phila., Pa.
- Hockert, Bruno E.,
Box 700, Hartford, Conn.
- Hodson, Eugene W.,
101 E. Baltimore st., Baltimore,
Md.
- Hoff, Carl William,
837 N. Delmar st., Indianapolis, Ind.
- Hoffelt, Edw.,
Estelline, S. D.
- Hoffer, Ralph Robert,
2260 W. Jefferson ave., Detroit,
Mich.
- Hoffman, Charles Elbert,
1901 Arch st., Philadelphia, Pa.
- Hoffman, E. Grace,
3238 Chestnut st., Philadelphia, Pa.
- Hoffman, Edward L.,
215 S. Broadway, Rochester, Minn.
- Hoffman, Geo. W.,
321 4th st., Logansport, Ind.
- Hoffman, Herbert H.,
Sandusky, Mich.
- Hoffman, Philip,
California, Pa.
- Hoffmann, Geo. F., Ph.G.,
Pesotum, Ill.

- Hogan, Walton Cloud,
Atkins, Ark.
- Hogstad, Anton Jr.,
S. D. State College of Agri.,
Brookings, S. D.
- Hohmann, Geo.,
2480 Concourse st., New York,
N. Y.
- Holcomb, Willis Cobb,
Residence Unknown.
- Holliday, Francis E.,
81 Fulton st., New York, N. Y.
- Holloway, Jesse D., Ph.G.,
Cor. 6th and Broadway, E. Liver-
pool, O.
- HOLMES, CLAYTON W.,
410 W. Gray st., Elmira, N. Y.
- HOLMES, HENRY E.,
P. O. Box 1897, Seattle, Wash.
- Holthoefer, Herman J.,
3300 State st., Chicago, Ill.
- Holtzman, Chas. H.,
Baltimore & Centre, Cumberland,
Md.
- Holverson, Henry T.,
Alexandria, Minn.
- Holzhauser, Chas. Wm.,
53 Spruce st., Newark, N. J.
- Honens, Hugh Benton,
425 Harrison, Oak Park, Ill.
- Honorof, Peter,
36 W. 11th ave., Gary, Indiana.
- HOOD, CHAS. IRA,
Merrimac and Central sts., Lowell,
Mass.
- Hoover, Geo. W.,
Food Inspection Laboratory, 1607
Transportation Bldg., Chicago,
Ill.
- Hopkins, Jesse L.,
Woodbridge Bldg., 100 Williams
st., New York, N. Y.
- Hopkins, Robert Smith,
Johnson's Pharmacy, East Radford,
Va.
- HOPP, LEWIS C.,
1104 Euclid ave., Cleveland, O.
- Horlick, Alexander J.,
Horlick Food Co., Racine, Wis.
- Horlick, William,
c. Horlick's Malted Milk Co.,
Racine, Wis.
- Horlick, William, Jr.,
c. Horlick's Malted Milk Co.,
Racine, Wis.
- HORN, WILBUR F.,
26 W. High st., Carlisle, Pa.
- Horne, Warren W., Ph.C.,
23 Hay st., Fayetteville, N. C.
- Horstmann, Gustave, Ph.D.,
136 S. 8th ave., Mt. Vernon, N. Y.
- Hostmann, Jeannot,
115 W. 68th st., New York, N. Y.
- Hottinger, Otto G.,
801 Milwaukee ave., Chicago, Ill.
- Houghton, E. M., Ph.C., M.D.,
c. Parke, Davis & Co., Detroit,
Mich.
- Hover, Wm. A.,
1437 Lawrence st., Denver, Colo.
- Hover, William Tracy,
1439 Franklin st., Denver, Colo.
- Howard, Charles H., Ph.G.,
Market Square, South Paris, Me.
- Howard, Fletcher (Mrs.),
401 S. Grand ave., Los Angeles,
Cal.
- Howard, Searcy Bennett,
Oklahoma City, Oklahoma.
- Howell, Ada Lee,
194 S. Main st., Akron, O.
- Howell, Edw. V.,
Univ. Drug. Co., Chapel Hill, N. C.
- Hoye, Daniel J.,
Overton, Neb.
- Hoyer, Benjamin,
1122 Central ave., Newport, Ky.
- Hron, Ralph Preston,
El Dorado, Kans.
- Hubbard, Geo. W.,
1118 First ave., S., Nashville, Tenn.
- Hubbard, Newman Grady,
Lineville, Ala.
- Hubbard, Winfield S., Ph.G., B.S.,
M.A., Ph.D.,
113 W. 18th st., c. Wm. R. War-
ner, New York, N. Y.
- Huber, Donald Witherow,
39 S. 10th st., Philadelphia, Pa.

- Hudelson, F. H.,
Weatherford, Okla.
- Huder, Henry J.,
102 Washington st., Indianapolis,
Ind.
- Hudson, Arthur,
265 Washington st., Newton, Mass.
- Hudson, Edgar Yager,
Shenandoah, Va.
- Hudson, John R.,
136 Prospect st., Waltham, Mass.
- Hufford, H. S.,
109 Carey ave., Wilkes-Barre, Pa.
- Hughes, Francis S.,
15th & Oxford sts., Philadelphia,
Pa.
- Hughes, Harry C.,
15 W. Main st., Plymouth, Pa.
- Hughes, James A.,
19th & Chester ave., Bakersfield,
Cal.
- Hughes, James Lewis,
2108 1st ave., Birmingham, Ala.
- Huhn, Chas. H., Ph.C.,
Nicollet, Cor. 24th st., Minne-
apolis, Minn.
- Hull, Chas. T.,
141 Dixwell ave., New Haven,
Conn.
- Hulskamp, Clara C.,
546 West st., Catherine, Louis-
ville, Ky.
- Humma, Henry Hermann,
Metropolis, Ill.
- Humma, James Bernard,
513 Girard ave., Metropolis, Ill.
- Hummel, John A.,
New Madrid Co., New Madrid, Mo.
- Hunsberger, Ambrose,
1600 Spruce st., Philadelphia, Pa.
- Hunsche, Frederick,
4415 N. Winchester ave., Chicago,
Ill.
- Hunt, Frank Louis,
Residence unknown.
- Hunt, Reid,
Harvard Medical School, Boston,
Mass.
- Hunter, N. H.,
Fort Myers, Fla.
- Hurley, Horace O.,
2038 Park Pl., Louisville, Ky.
- Hurley, John,
507 Main st., Little Falls, N. Y.
- Hurst, Robert Oscar,
391 Jarvis st., Toronto, Ontario,
Canada
- Hurty, John N., M.D., Phar.D.,
31 E. 11th st., Indianapolis, Ind.
- Hurwitz, Eliaku S.,
1796 Bathgate ave., New York,
N. Y.
- Huston, Lotis Loma,
200 Harrison st., Oak Park, Ill.
- Hyde, Byron M.,
202 Main st., E., Rochester, N. Y.
- Hyde, Joseph B., Jr., Ph.G.,
141 Broad st., Cor. of Logan,
Charleston, S. C.
- Hynson, Henry P.,
423 N. Chas. st., Baltimore, Md.
- Igler, Herman E.,
Glendale, Ohio.
- Ilhardt, Wm. K.,
4836 Delmar Blvd., St. Louis, Mo.
- Imson, Juan Rosales,
97 Real St., Manila, P. I.
- Ingram, Frederick Fremont, Jr.,
56 Tenth st., Detroit, Mich.
- Irwin, William W.,
Cor. 24th & Chapline sts., Wheel-
ing, W. Va.
- Israel, Boris S.,
903 Teller ave., New York, N. Y.
- Israel, David,
1037 Teller ave., New York, N. Y.
- Ivanoff, Petko Lazaroff,
210 Chene st., Detroit, Mich.
- Jackson, John Edward,
Tazewell, Va.
- Jackson, Wm. R.,
281 Greene ave., Brooklyn, N. Y.
- Jacob, Charles William,
7405 Madison st., Forest Park, Ill.
- Jacobs, Sinclair Sartorius,
c. Jacob's Pharmacy Co., Atlanta,
Ga.
- Jacobsohn, Joseph,
3639 Third ave., New York, N. Y.

- Jacobson, Michael,
2600 N. Halsted st., Chicago, Ill.
- Jacobson, Samuel M.,
171 4th st., Elizabeth, N. J.
- Jacocks, John T.,
Dyersburg, Tenn.
- Jaffe, Hyman,
3212 W. Dauphin st., Philadelphia, Pa.
- JAMIESON, THOS. N.,
366 Markham Pl., Pasadena, Calif.
- Jamieson, Walter Albert,
2456 N. Meridian st., Indianapolis, Ind.
- Janda, Thomas John Joseph,
1017 E. Ohio st., N. S., Pittsburgh, Pa.
- Jarrett, Walter R.,
308-9 Patterson Bldg., Oklahoma City, Okla.
- Jarrett, Wm. Ambrose,
9 Park Vale ave., Suite 2, Allston, Mass.
- Jeancon, Louis A.,
1025 East Ninth ave., Denver, Colo.
- Jee, S. H., Dr.,
11 Area Preta, Macau, China.
- Jehlik, Anton J.,
3401 W. 26th st., Chicago, Ill.
- Jelinek, John P.,
295 W. 7th st., St. Paul, Minn.
- Jenkins, Cecil Lester,
Italy, Texas.
- Jenkins, Edw. H.,
Analytical Lab., Drawer 1, New Haven, Conn.
- Jenkins, Elizabeth (Miss),
5th st. & Wayne ave., Dayton, O.
- Jenkins, William P.,
5th & Ludlow sts., Dayton, Ohio.
- Jennings, Ralph Crawford,
5217 Cornell ave., Chicago, Ill.
- Johann, Adam E.,
827 W. Main st., Richmond, Va.
- Johnson, Albert Burtis,
410 River ave., Point Pleasant, N. J.
- Johnson, Alfred Richard,
Little Falls, Minn.
- Johnson, C. D.,
Brainerd, Minn.
- Johnson, Charles S.,
c. Tampa Drug Co., Tampa, Fla.
- Johnson, Chas. W., Ph.C., B.S., Ph.D.,
4515 16th ave., N. E., Seattle, Wash.
- Johnson, Hans Martin,
4th & St. Peter sts., St. Paul, Minn.
- Johnson, John T.,
105 Lincoln ave., -E., Fergus Falls, Minn.
- Johnson, Leland A.,
4809 N. 24th st., Omaha, Neb.
- Johnson, Manuel, M.D.,
P. O. Box 750, Havana, Cuba.
- Johnson, M. G.,
Fulda, Minn.
- Johnson, P. Ellsworth,
404 S. Ashland Blvd., Apt. 2, Chicago, Ill.
- Johnson, Theo., M.D.,
P. O. Box 750, Havana, Cuba.
- Jones, Amos,
543 E. Thompson st., Philadelphia, Pa.
- Jones, David F., Ph.G.,
106 Granite Block, Watertown, S. D.
- Jones, Dillwyn W.,
Mabel, Minn.
- Jones, Edw. B.,
218 High st., Mt. Holly, N. J.
- Jones, Ernest Ray,
489 Bewick ave., Detroit, Mich.
- Jones, Harold V.,
Cowden, Ill.
- Jones, Harold W.,
c. William S. Merrell Chemical Co., 5th & Pike sts., Cincinnati, O.
- Jones, James H.,
350 E. Fordham Road, New York, N. Y.
- Jones, Orel, Ph.G.,
Oconto, Neb.
- Jones, Oscar W.,
27 Court st., Auburn, Me.
- JONES, SIMON N.,
2d & Main sts., Louisville, Ky.
- Jongejan, Cornelius H.,
753 Grandville ave., Grand Rapids, Mich.

- Jordan, Chas. B., Ph.C., B.S., M.S.,
409 Russell st., Lafayette, Ind.
- Jordan, John M.,
209 Rutledge ave., Charleston,
S. C.
- Jorden, Henry Albert, Ph.G.,
56 E. Commerce st., Bridgeton,
N. J.
- Jorgenson, Arthur Lawrence Theodore,
781 Castro st., San Francisco,
Cal.
- Jorgenson, Edw. B.,
625 Kearny st., San Francisco,
Cal.
- Josenhans, Reinhardt C. J.,
1606 W. North ave., Chicago, Ill.
- Judd, Albert F.,
Pitts. Coll. of Ph., Pittsburgh, Pa.
- Judd, Cornelius M.,
615 S. Cutler st., Rochester, Minn.
- Judisch, George,
Ames, Iowa.
- Judy, J. N., M.D.,
Petersburg, W. Va.
- Jurado, Bolivar, Ph.C., Ph.D.,
P. O. Box 80, David, Chiriqui,
Rep. de Panama.
- Kaczoroski, Adolph O.,
133 Bourbon st., New Orleans, La.
- Kagy, Elbert O., Ph.G., Ph.C.,
3931 6th ave., Des Moines, Ia.
- Kahn, Solomon K.,
11th st. & Washington ave.,
Philadelphia, Pa.
- Kalish, Oscar G., Ph.G.,
626 Madison ave., New York, N. Y.
- Kalusowski, Henry E.,
808 Eye st., N. W., Washington,
D. C.
- Kane, James F.,
6 S. Main st., Pittston, Pa.
- Kantner, Leahmer M.,
1747 Park ave., Baltimore, Md.
- Kantrowitz, Hugo,
104 John st., New York, N. Y.
- Kaplan, Samuel Solman,
4959 S. Ashland, Chicago, Ill.
- Karnofsky, Charles F.,
1823 Bryant ave., N., Minneapo-
lis, Minn.
- Kartman, Nathan,
1840 S. Kedzie ave., Chicago, Ill.
- Kassulke, August,
21 Madison Flats, Indianapolis,
Ind.
- Katz, Eugene,
895 West End ave., New York, N. Y.
- Katz, Otto,
1539 Vine st., Cincinnati, O.
- Kauffman, Geo. B.,
c. Kauffman Lattiner Co., Co-
lumbus, O.
- Kaufman, Reuben M., Ph.G.,
Cor. High & Pine sts., Seaford,
Del.
- Keagy, Elwood Milton,
605 S. Pittsburg st., Connels-
ville, Pa.
- Keating, Frank,
454 Folsom Pl., Milwaukee, Wis.
- Kebler, Lyman F.,
Bureau of Chem., Washington,
D. C.
- Keene, Bernard M.,
201 N. Delaware, Indianapolis,
Ind.
- Keim, Raoul D.,
111 N. Market st., Chicago, Ill.
- Keller, Andrew John,
739 Seneca st., Buffalo, N. Y.
- Kelly, Evander F., Phar.D.,
Lombard & Green sts., Baltimore,
Md.
- Kenaston, Hampton Ray (Mrs.), B.E.,
M.E.,
Bonesteel, S. D.
- Kendall, Gus C.,
4 S. 22nd ave., Meridian, Miss.
- Kendig, H. Evert,
5328 Baynton st., Philadelphia, Pa.
- KENNEDY, EZRA J.,
3 Park Pl., New York, N. Y.
- Kennedy, John Hoskins,
3935 Utah St., San Diego, Calif.
- Kepes, Jos.,
2017 W. 25th st., Cleveland, Ohio.
- Kercher, Edwin H., Ph.G.,
4128 Market st., Philadelphia, Pa.
- Kerr, Joseph Robert,
500 W. 172d st., New York, N. Y.

- Kerr, Julius,
500 W. 172d st., New York, N. Y.
- Kerr, Nathan,
556 Fox St., c. Sorensky, New York,
N. Y.
- Ketcham, Sylvius,
1815 3rd ave., New York, N. Y.
- Kettler, Edw., Jr.,
Farwell ave. & Brady st., Mil-
waukee, Wis.
- Kiedaisch, Geo. A.,
422 Main st., Keokuk, Ia.
- Kijanski, Leo,
114 N. Main st., Wilkes-Barre, Pa.
- KILMER, FRED B.,
147 College ave., New Brunswick,
N. J.
- Kimmich, Ernest,
c. Parke, Davis & Co., Detroit,
Mich.
- King, Geo. A. N.,
2631 S. Emerson, Minneapolis,
Minn.
- King, Ira Perkins,
112 S. Main st., Stillwater, Minn.
- King, James D.,
214 Westmount ave., Haddon-
field, N. J.
- Kingman, Ignatius,
East Grand Forks, Minn.
- Kinsey, Raymond Daniel,
U. S. Marine Hospital, New York
(Stapleton), N. Y.
- Kirby, Chas. P.,
33rd & Chestnut sts., Philadel-
phia, Pa.
- Kirchgasser, Wm. C., Ph.G.,
74 Laight st., New York, N. Y.
- Kirchgessner, Wm. C., Ph.C.,
7 N. Division ave., Grand Rapids,
Mich.
- Kirk, H. S.,
919 Front st., Sacramento, Cal.
- Kissick, Robert George,
199 Lincoln Pl., Brooklyn, N. Y.
- Klatz, Boruch,
81 Nepperhan ave., Yonkers,
N. Y.
- Klein, Edw. N. E., Ph.C.,
315 13th st., College Point, N. Y.
- Kline, A. J.,
2550 Bloomington ave., Minne-
apolis, Minn.
- Kline, Clarence M., Ph.B.,
429 Arch st., Philadelphia, Pa.
- Klingmann, Albert,
2631 8th ave., New York, N. Y.
- Klingmann, Otto,
2631 8th Ave., New York, N. Y.
- Klitsch, Charles J.,
129 Sunbury St., Minersville, Pa.
- Klopp, Henry L.,
3421 Spring Garden st., Phila., Pa.
- Knight, Chas. G.,
338 E. 51st st., Chicago, Ill.
- Knight, Frank H., A.B., Ph.G.,
568 Main st., Winchester, Mass.
- Knock, Thos. F.,
130 South ave., Petersburg, Va.
- Knoepfel, Wm. H.,
967 Prescott ave., Scranton, Pa.
- Knowlton, Geo. H.,
782 Union st., Manchester, N. H.
- Kobylanski, John Francis,
2242 Professor st., Cleveland, O.
- Koch, Albert H.,
2401 N. Jefferson ave., St. Louis,
Mo.
- Koch, Anthony Philip,
248 Rivington st., New York, N. Y.
- Koch, Edward William,
c. University of Buffalo, Med.
Dept., Buffalo, N. Y.
- Koch, Howard Jonathan,
Coopersburg, Pa.
- KOCH, JULIUS A.,
Bluff & Pride sts., Pittsburgh, Pa.
- Koch, Louis William,
Towner, N. D.
- Koch, Wm. J.,
651 E. 230th st., New York, N. Y.
- Kochanski, Edmund H. J.,
1142 8th ave., Milwaukee, Wis.
- Koefod, Lawitz M.,
Granite Falls, Minn.
- Koehler, Wm. F.,
603 E. Davis st., Portland, Ore.
- Koelble, Carl Robert,
333 Jones ave., Burlington, N. J.

- Koenig, Otto L., Jr.,
4819 N. Mervine St., Philadelphia,
Pa.
- Koerber, Charles Jacob,
2204 N. 7th st., Philadelphia,
Pa.
- Koerth, Emil C.,
Yoakum, Tex.
- Koester, Hermann,
3301 ave. H, Galveston, Tex.
- Kogon, S. P.,
1852 George st., Chicago, Ill.
- Kohler, Charles,
205 Cliveden ave., Glenside, Pa.
- Kolar, Gustav S.,
6 S. Seeley ave., Chicago, Ill.
- Kolb, Philip Jacob,
2401 Clybourn ave., Chicago, Ill.
- Kolbe, Emil B.,
681 Dix ave., Detroit, Mich.
- Kolsch, Harry,
P. O. Box 915, Leadville, Colo.
- Konantz, William A.,
530 Hampshire st., Quincy, Ill.
- Konzelman, Theodore,
146 Grove ave., Highland Park,
Mich.
- Koon, Chas. S.,
35 W. Western ave., Muskegon,
Mich.
- Kornfield, Alexander,
1065 Morris ave., New York, N. Y.
- Kossler, Herman S.,
206 S. Main st., Pittsburgh, Pa.
- Kozlowski, Boleslaw Roman,
4800 S. Loomis st., Chicago, Ill.
- Kraemer, Frank W.,
5969 South Blvd., Chicago, Ill.
- Kraemer, George Charles,
5952 West Lake st., Chicago, Ill.
- KRAEMER, HENRY,
University of Michigan, College of
Pharmacy, Ann Arbor, Mich.
- Kraemer, William Charles,
Box 152, Linden, N. J.
- Kraker, John L.,
Bozeman, Mont.
- Kramer, Chas. F.,
Cor. 3rd & Broad sts., Harris-
burg, Pa.
- Krembs, Ernest M.,
1025 National ave., Milwaukee,
Wis.
- Kremer, Berthold J.,
88 S. Main st., Fond du Lac, Wis.
- KREMERS, ED., PH.G., PH.D.,
1720 Vilas st., Madison, Wis.
- Kretz, Edw. J.,
1800 Webster ave., Pittsburgh,
Pa.
- Krieg, Arch,
919 Quarrier st., Charleston, W
Va.
- Krieger, John C.,
104 Broad st., Salamanca, N. Y.
- Kring, Gustav,
2735 S. Broadway, St. Louis, Mo.
- Krizan, John,
4200 W. Van Buren st., Chicago,
Ill.
- Krueger, E. E.,
Glenwood, Minn.
- Krumwiede, Howard Andrew,
620 Decatur st., Brooklyn, N. Y.
- Kuenzig, Peter A.,
2727 Custer st., Carrick, Pa.
- Kuever, Rudolph A., Ph.G., Ph.C.,
Coll. of Pharm., Iowa City, Ia.
- Kuhe, Bruno Kanders,
821 Cauldwell ave., New York, N. Y.
- Kuller, Mrs. G. P.,
Castleton Apt., St. George,
Staten Island, N. Y.
- Kurrasch, Albert A.,
301 W. 47th st., Chicago, Ill.
- Kurtz, Irving W.,
3rd & Cedar, St. Louis, Mo.
- Kusterman, Fred G.,
1517 Como ave., S. E., Minne-
apolis, Minn.
- Kutscher, Geo. W.,
812 Braddock ave., Braddock, Pa.
- Kyser, Edward Vernon,
206 E. 2nd st., Covington, Ky.
- Lackenbach, Fred. I., Ph.C.,
908 Butler Bldg., San Francisco,
Cal.
- Lackey, Richard H., Ph.G.,
500 W. Lehigh ave., Philadelphia,
Pa.

- Ladakis, Traintaphyllo,
Syrian Prot. Coll., Beirut, Syria.
- Ladish, Erich H.,
Cor. North ave. & Wells st.,
Chicago, Ill.
- Ladrigan, John Paul,
2358 Bedford ave.; c. E. W.
Hills, Cincinnati, Ohio.
- LaGrange, John V., Ph.G., A.M.,
U. S. Public Health Service,
Washington, D. C.
- Lakamp, William,
3774 Andrews st., Oakley Sta.,
Cincinnati, O.
- Lake, Gillis Q.,
6th & Ministota sts., Kansas
City, Kansas.
- Lamar, Wm. R.,
763 E. 25th St., Paterson, N. J.
- Lambert, Alert Bond,
2100 Locust st., St. Louis, Mo.
- Lambert, Maud, Ph.G.,
Franklin Road Pharmacy,
Roanoke, Va.
- Lammon, G. E.,
606 Laurel st., Brainerd, Minn.
- LaMonte, Frank Vincent,
2289 1st ave., New York, N. Y.
- Lampa, Robert R.,
c. Lehn & Fink, New York, N. Y.
- Land, Robert H., Jr.,
1134 Broad st., Augusta, Ga.
- Lange, Leonard A.,
c. Yahr A. Lange Drug Co., Mil-
waukee, Wis.
- Lange, William Maurice,
57 Dove st., Cor. Lancaster st.,
Albany, N. Y.
- Langenhan, Henry A.,
1821 West Lawn ave., Madison,
Wis.
- Langfield, Conrad Edward,
Northville, Mich.
- Langheinze, Louis P.,
857 Elizabeth ave., Elizabeth,
N. J.
- Lantz, Wm. H.,
1601 Lehigh ave., Philadelphia,
Pa.
- Lapeyre, Ben E., Jr.,
Gt. Falls, Mont.
- La Pierre, Elie H., Ph.G.,
80 River st., Cambridge, Mass.
- Larsen, L. P., Ph.G.,
3201 W. Madison st., Chicago, Ill.
- Larson, Martin,
Box 32, Callender, Webster Co., Ia.
- Lascoff, Jacob L.,
1223 Lexington ave., New York, N. Y.
- Laue, John M. A.,
175 3rd st., Portland, Ore.
- La Wall, Charles H., Ph.G., Ph.M.,
39 S. 10th st., Philadelphia, Pa.
- La Wall, Millicent R. (Mrs.), P.D.,
39 So. 10th st., Philadelphia, Pa.
- Lawrence, John Noble,
Hospital Corps Training School,
Naval Operating Base, Hampton
Roads, Va.
- Lawson, Chas. E.,
1117 Ewing st., Indianapolis, Ind.
- Lea, E. J.,
Bureau of Food & Drugs, Univ. of
Calif., Berkeley, Calif.
- Leavitt, Adoniram J.,
537 North Chester ave., Pasadena,
Calif.
- Leber, Jacob Gilbert,
114 Pine st., York, Pa.
- Lee, Charles O.,
Purdue University, School of
Pharmacy, W. Lafayette, Ind.
- Lee, John V.,
N. E. Cor. Main st. & Chicago
ave., Evanston, Ill.
- Lee, Tachong,
29 14th Ave., Columbus, Ohio.
- Leedom, Chas.,
1403 Filbert st., Philadelphia, Pa.
- Leet, Robert A.,
Box 477, Oakland, Cal.
- Legendre, Joseph A.,
124 Baronne st., New Orleans, La.
- Lehman, Chas. N.,
Broadway & Main sts., Totten-
ville, N. Y.
- Lehman, Chas. Walter, A.B.,
c. Colonial Drug Co., Hot Springs,
Ark.

- Lehman, Robert S.,
 375 3rd ave., New York, N. Y.
 Lehmann, Louis J.,
 2601 Washington ave., St. Louis,
 Mo.
 Lehning, Fred P.,
 1717 Commercial ave., Cairo, Ill.
 Lehr, Frank P.,
 5400 Franklin ave., Cleveland, O.
 Lemasters, Wm. O.,
 Lock Box 199, Brooksville, Fla.
 LEMBERGER, JOS. L., PhG., Ph.M.,
 5 N. 9th st., Lebanon, Pa.
 Lengfeld, Joseph L.,
 272 Post st., San Francisco, Cal.
 Leonard, Edwin F.,
 72 Main st., Springfield, Mass.
 Lerche, Albert E.,
 325 Main st., Springfield, Mass.
 Lerou, Herbert M.,
 289 Main st., Norwich, Conn.
 Leslie, Frederick Arthur,
 79 Post ave., New York, N. Y.
 Leth, Eric Gunnar,
 152 E. 22nd st., Indianapolis, Ind.
 Levery, John A.,
 608 Park ave., Bridgeport, Conn.
 Levy, Louis Spencer,
 80 Maiden Lane, New York, N. Y.
 Lewis, Ernest G.,
 701 Center st., Jamaica Plain, Mass.
 Lewis, Henry,
 State & Gilman sts., Madison, Wis.
 Lewis, Lawrence C.,
 Tuskegee, Ala.
 Lewis, Robert Henry, Jr.,
 P. O. Box, Gulfport, Miss.
 Lich, Robert,
 2720 Tulare st., Fresno, Cal.
 Lichtenstein, Julian,
 17th & Main sts., Richmond, Va.
 Lieberstein, Jacob, Ph.G.,
 2329 N. Union Blvd., St. Louis, Mo.
 Lieberstein, Louis,
 223 S. Euclid ave., St. Louis, Mo.
 Liebman, Samuel,
 230 Ellery St., Brooklyn, N. Y.
 Lifshitz, Jacob,
 953 Fox st., New York, N. Y.
 Light, Isam M.,
 31 W. Lake st., Chicago, Ill.
 Light, S. Rudolph,
 c. Upjohn Co., Kalamazoo, Mich.
 Lilly, Eli,
 4 W. St. Joe st., Indianapolis, Ind.
 Lilly, Josiah K.,
 1420 Meridian st., N., Indian-
 apolis, Ind.
 Lilly, Josiah Kirby, Jr.,
 1044 N. Delaware st., Indian-
 apolis, Ind.
 Linck, Truman A.,
 904 Grand ave., Kansas City, Mo.
 Lindh, Berger,
 3000 E. 79th st., Chicago, Ill.
 Lindley, Patrick H.,
 Havana, Kans.
 Lindly, John M., Ph.G.,
 Winfield, Henry Co., Ia.
 Lindvall, Chas. G.,
 1303 13th st., Moline, Ill.
 Link, Alexander J.,
 U. S. Naval Hospital, Great
 Lakes, Ill.
 Linton, Arthur W.,
 Coll. of Pharm., Univ. of Wash.,
 Seattle, Wash.
 Lipscomb, W. L.,
 c. Taylor Drug Co., Dyersburg,
 Tenn.
 Littlejohn, Horace C.,
 Leesburg, Va.
 Llarena, y Maria G.,
 Jesus del Monte 518, Havana,
 Cuba.
 Llewellyn, Henry Duncan,
 West Side Square, Mexico, Mo.
 LLOYD, JOHN URI,
 Court & Plum sts., Cincinnati, O.
 Lock, Frank E.,
 1133 Seneca st., Buffalo, N. Y.
 Locke, Charles A.,
 Brookings, S. D.
 Lockie, Peter M.,
 2646 Main st., Buffalo, N. Y.
 Loertz, Carl E.,
 1 E. Second st., Seymour, Ind.
 Loesch, Wm., Ph.G.,
 3040 Wentworth ave., Chicago, Ill.

- Loesser, Paul A.,
Monroe & Lawrence ave., Toledo,
O.
- Lohmann, John,
887 Market st., Kingston, Pa.
- Lohmeyer, Henry L.,
1901 Carson st., Pittsburgh, Pa.
- Lohness, Archie P.,
565 Quincy st., Brooklyn, N. Y.
- Long, Eugene Hughes,
117 North Adams St., Dallas,
Texas.
- Loomis, Russell Newton,
1048 11th st., Boulder, Colo.
- Lord, Frank J.,
1101 Larimer st., Denver, Colo.
- Lord, Leon S.,
267 Jewett ave., West New
Brighton, N. Y.
- Lore, John D.,
333 Second ave., New York, N. Y.
- Loring, Charles A.,
145 Front st., New York, N. Y.
- Lotz, Emma Grace, Phaf.D.,
2135 Mt. Holly st., Baltimore,
Md.
- Loud, Theodore Richard L.,
270 Fort Washington ave., New
York, N. Y.
- Louis, H. Cramer,
c. G. T. Harvey Co., Saratoga
Springs, N. Y.
- Loussac, Zachary Joshua,
Anchorage, Alaska.
- Lovis, Henry C.,
490 West End ave., New York,
N. Y.
- Lowe, Clement B., Ph.B., M.D.,
Lovebrook, Vineland, N. J.
- Lowry, William J., Jr.,
42 Talbot Road, Windsor Hills,
Baltimore, Md.
- Lucas, Pauline Strauel (Miss),
Residence Unknown.
- Luck, Julius A. W.,
Residence Unknown.
- Luck, Louis H.,
198 N. Union st., Burlington, Vt.
- Ludwig, Wm. E.,
1344 Dorr st., Toledo, O.
- Luft, George W.,
344 W. 72nd st., New York, N. Y.
- Lurie, James,
750 Lexington ave., New York,
N. Y.
- Lyle, Walter L.,
Bedford City, Va.
- Lyman, Rufus A., A.B., A.M., M.D.,
1649 S. 21st st., Lincoln, Neb.
- Lyndrup, Chris.,
32 Adams st., W., Detroit, Mich.
- Lynn, Chas. J.,
c. Eli Lilly & Co., Indianapolis,
Ind.
- Lynn, Ellsworth,
312 Wyoming ave., Kingston, Pa.
- Lyon, Arthur G.,
Dorrance Drug Co., Coldwater,
Mich.
- Lyon, Harold Morgan,
602 S. Chestnut St., Ravenna, Ohio.
- LYONS, ALBERT B.,
102 Alger ave., Detroit, Mich.
- Lyons, Lucien E.,
Camp & Gravier sts., New Or-
leans, La.
- Lyons, Michael F.,
535 Boylston st., Boston, Mass.
- Maas, Arthur R.,
308 E. 8th st., Los Angeles, Cal.
- Maas, Henry C.,
Bowdle, S. D.
- Mace, John Edward,
168 Duane st., New York, N. Y.
- MacDonald, Donald Boston,
Munich, N. D.
- MacGregor, Charles,
Box 378, Detroit, Mich.
- Maggio, James I.,
494 Spring st., W. Hoboken,
N. J.
- Maguire, Andrew,
6543 Sheridan Road, Chicago, Ill.
- Maguire, Edw. S., Ph.G.,
U. S. Marine Hospital, Detroit,
Mich.
- Mahoney, Wilber Alexander,
1423 Forbes st., Jacksonville, Fla.
- Maines, Eugene L., M.D.,
245 Quincy st., Brooklyn, N. Y.

- Maisel, Joseph,
 989 Amsterdam ave., New York,
 N. Y.
 Major, Alphonse,
 461 Pearl st., New York, N. Y.
 Mallard, Albert E.,
 961 Michigan ave., Detroit, Mich.
 Mallard, Oscar Paul,
 4601 N. 12th st., Philadelphia, Pa.
 MALLINCKRODT, EDW.,
 Mallinckrodt & Main sts., St.
 Louis, Mo.
 Maltbie, Birdsey L.,
 250 High st., Newark, N. J.
 Mamer, Bernard,
 Welcome, Minn.
 Mandabach, Peter A.,
 608 S. Dearborn st., Chicago, Ill.
 Mangan, Daniel C.,
 95 Park ave., Brooklyn, N. Y.
 Mann, Charles F.,
 901 Woodward ave., Detroit,
 Mich.
 Mansfield, Wm.,
 36 Hollywood st., E. Orange, N. J.
 Mantell, David R.,
 71 E. 121st st., New York, N. Y.
 Marchonski, Samaron,
 2025 LaFontain ave., New York,
 N. Y.
 Marckworth, Otto Stanley,
 426 Chamber of Commerce,
 Columbus, O.
 Mares, Frank M., Ph.G.,
 2876 Archer ave., Chicago, Ill.
 Margerum, Donald Cameron,
 39 S. 10th st., Philadelphia, Pa.
 Marianowsky, Jacob,
 1233 Flatbush ave., Brooklyn,
 N. Y.
 Marquier, Adolph F., Ph.G.,
 1041 S. Orange ave., Newark, N. J.
 Marr, Fred D.,
 1124 Pacific ave., Tacoma, Wash.
 Martel, John Edward,
 152 A. ave., Turners Falls, Mass.
 Martin, Albert J.,
 3416 S. Spring ave., St. Louis, Mo.
 Martin, Thomas Fairfax,
 Tazewell, Virginia.
 Marvin, Z. E.,
 Main & Akard sts., Dallas, Tex.
 Mash, Henry Terrell, Jr.,
 Thomasville, Ga.
 Mason, Harlin Eggleston,
 Main st., Smithville, Tenn.
 Mason, Harry B.,
 P. O. Box 484, Detroit, Mich.
 Master, Walter,
 Willow City, N. D.
 Matlin, Abraham,
 962 S. Blvd., Bronx, New York,
 N. Y.
 Matlin, Max,
 2257 2d ave., New York, N. Y.
 Matthews, Chas. E.,
 c. Sharp & Dohme, 169 N. Frank-
 lin, Chicago, Ill.
 Mattison, Richard V., M.D.,
 Ambler, Pa.
 Matton, Geo. A.,
 107 N. Main st., High Point, N. C.
 Matusow, Harry, Ph.G.,
 300 W. Columbia ave., Philadel-
 phia, Pa.
 Mauzy, James G.,
 511 Main st., Plattsmouth, Neb.
 Mawrence, Israel,
 4914 Forestville ave., Chicago,
 Ill.
 May, Edwin W.,
 54 W. Main st., Martinsville, Ind.
 Mayer, Harry O.,
 Box 133, Sheffield, Pa.
 Mayer, Joseph L., Ph.G., Ph.D.,
 340 W. 4th st., New York, N. Y.
 Mayo, Caswell A.,
 66 W. Broadway, New York,
 N. Y.
 Mayo, Redmond,
 1033 22d st., N. W., Washington,
 D. C.
 Mazanaski, Edw. C.,
 439 Main st., Kingston, Pa.
 McBride, Chas. L.,
 634 Broadway, Kingston, N. Y.
 McCall, Henry,
 223 Arundel st., St. Paul, Minn.
 McCartney, Frank L., Ph.D.,
 Residence Unknown.

- McCauley, Charles E.,
 106 Marion st., Oak Park, Ill.
 McCasland, Harloven H.,
 c. Abbott Alkaloidal Co., 4753
 Ravenswood ave., Chicago, Ill.
 McClallen, Edw. G.,
 7 Merchants Row, Rutland, Vt.
 McClerkin, Felix Wm.,
 700 Main st., Little Rock, Ark.
 McCloskey, Charles J.,
 351 Montgomery st., Jersey City,
 N. J.
 McClugage, John J.,
 1140 E. 63rd st., Chicago, Ill.
 McClure, Maurice Axe,
 501 E. Girard ave., Philadelphia, Pa.
 McConnell, Andrew B.,
 Omaha, Neb.
 McConnell, Lewis Wm., Ph.G.,
 212 Main ave., McCook, Neb.
 McCormick, Peter J.,
 27 South st., Brighton, Mass.
 McCracken, H. S.,
 923 W. 19th Pl., Chicago, Ill.
 McCroskey, Virgil T.,
 206 Main st., Colfax, Wash.
 McDaniel, Gerald Litton,
 1625 W. Van Buren st., Chicago, Ill.
 McDiarmid, Daniel P.,
 1122 Forrest ave., Gadsden, Ala.
 McEckron, George Milton,
 Lucas, Kans.
 McELHENIE, THOS. DEARMOND, Ph.G.,
 259 Ryerson st., Brooklyn, N. Y.
 McEwen, Irving,
 3507 Dewey ave., Omaha, Neb.
 McGill, Anthony,
 317 Queen st., Ottawa, Canada.
 McGill, John T.,
 Vanderbilt Univ., Nashville, Tenn.
 McGogy, James Frank,
 4412 Evanston st., Seattle, Wash.
 McIntire, Martin J.,
 1461 Washington st., Boston, Mass.
 McIntyre, Ewen, Jr.,
 992 6th ave., New York, N. Y.
 McKellips, Clarence M.,
 Northern Pacific Coll. of Pharm.
 & Dentistry, Portland, Ore.
 McKenzie, Robert H., Ph.G.,
 Leadville, Colo.
 McKesson, Donald, B.A.,
 91 Fulton st., New York, N. Y.
 McKesson, Geo. C.,
 91 Fulton st., New York, N. Y.
 McKesson, John, Jr.,
 91 Fulton st., New York, N. Y.
 McKinney, Robert S., Ph.G.,
 Taneytown, Md.
 McLean, James W.,
 P. O. Box 557, Seattle, Wash.
 McMahon, Joseph,
 2755 E. 26th st., Sheepshead Bay,
 N. Y.
 McMullin, David John, Ch. Pharm.
 Mate, U. S. N.,
 Pago Pago Tutnilla, American
 Samoa.
 McNeary, William Wilson,
 1700 Mt. Vernon st., Philadelphia,
 Pa.
 McNeil, Robert,
 Front & York sts., Philadelphia,
 Pa.
 McNeil, Wm. H.,
 Main & Jefferson sts., Passaic, N. J.
 Mc Nerney, Michael Francis,
 Ridge ave., Sharpsville, Pa.
 McNess, Fred. Wm., P.D.,
 23 Liberty st., Freeport, Ill.
 McNiff, Frank J.,
 Anthon, Ia.
 McNulty, James C.,
 1323 Brownsville Rd., Mt. Olive
 Sta., Pittsburgh, Pa.
 McNulty, William Peter,
 21 Gold st., Norwich, N. Y.
 McRae, Emily C. (Mrs.),
 E. 1928 Sprague ave., Spokane,
 Wash.
 McTague, Edw. J.,
 2601¹/₂ Jackson st., Seattle, Wash.
 McWilliams, Herschel Brian,
 School of Pharmacy, Corvallis, Ore.
 Mead, Harold B.,
 Woodstown, N. J.
 Means, Earl A.,
 281 Green ave., Brooklyn, N. Y.

- Mebane R. Ramsay,
 308 E. Northampton st., Wilkes-
 Barre, Pa.
 Meeker, Geo. H., B.S., M.S., Ph.D.,
 Phar.D., D.D.S., LL.D.,
 School of Med., Univ. of Pa.;
 c. Dr. S. Egbert, Philadelphia, Pa.
 Megaw, Herschel,
 132 E. Capitol st., Washington, D. C.
 Meier, Rudolph L.,
 1246 O st., Lincoln, Neb.
 Meissner, Fred Wm., Jr., Ph.G.,
 820 Main st., La Porte, Ind.
 Meister, Edward James,
 260 N. 11th st., Cedar Rapids,
 Iowa.
Mellor, Alfred,
 152 W. Walnut Lane, German-
 town, Philadelphia, Pa.
 Melton, Hearn Howell,
 Broad st., Thomasville, Ga.
 Menger, Ruth Caroline,
 1500 N. 29th st., Philadelphia, Pa.
 Menk, Chas. Wm.,
 106 Market st., Newark, N. J.
 Mentz, Otto Herman,
 1057 Belmont ave., Chicago, Ill.
 Menzel, Max,
 Pipestone, Minn.
 Menzies, John Wm.,
 69 West ave., Buffalo, N. Y.
 Meredith, Harry L.,
 456 Summit ave., Hagerstown, Md.
 Mergens, Peter,
 Fairmount, N. D.
 Merner, Garfield David,
 500 N. Commercial st., St. Louis,
 Mo.
 Merner, Paul Marcus P.,
 P. O. Box 137, Leland Stanford
 Univ., Calif.
 Merrell, Chas. G., S.B.,
 3595 Wilson ave., Avondale, O.
 Merrell, Geo. R.,
 6209 Wash. ave., St. Louis, Mo.
 Merrell, Hubert S., Jr., Ph.B., Ph.C.,
 4th & Market sts., St. Louis, Mo.
 Merrill, Edward C.,
 Analytical & Research Lab.,
 United Drug Co., Boston, Mass.
- Meserve, Albert W., A.M., B.A.,
 10 Main st., Kennebunk, Me.
 Messing, Richard J.,
 296 Sibley st., St. Paul, Minn.
 Metz, Abraham L.,
 Richardson Chem. Bldg., Tulane
 Univ., New Orleans, La.
 Metz, Herman A.,
 122 Hudson st., New York, N. Y.
 Metzger, Arthur S., Ph.G., Ph.C.,
 Malden, Mo.
 Metzger, Fred W.,
 230 W. Carpenter st., Springfield,
 Ill.
 Meuser, Louis J.,
 8 N. Sussex st., Dover, N. J.
 Meyer, Carl F. G.,
 Meyer Bros. Drug Co., St. Louis,
 Mo.
 Meyer, Charles L.,
 1531 Madison ave., Baltimore,
 Md.
 Meyer, Frank B.,
 848 Broadway, Gary, Ind.
 Meyer, Fred H.,
 3207 N. Ashland ave., Chicago,
 Ill.
 Meyer, Samuel,
 Roslyn Heights, Long Island,
 N. Y.
 Meyer, Walter F.,
 P. O. Box 717, Colorado City,
 Colo.
 Meyers, Theodore,
 674 Wyoming ave., Dorrance-
 ton, Pa.
 Michaelis, Gus, Ph.G., Prof. Pharm.,
 541 Western ave., Albany, N. Y.
 Michaels, George L.,
 32 Vernon ave., Long Island City,
 N. Y.
 Mick, John Geo.,
 2843 Indiana ave., Chicago, Ill.
 Micklesen, Henry C.,
 Hudson, Wisc.
 Miersch, Rudolph Victor,
 1132 W. Broadway st., Louisville,
 Ky.
 Mierzwa, Richard,
 4724 Liberty ave., Pittsburgh, Pa.

- Mikkelsen, Niels,
Kenesaw, Neb.
- MILLER, ADOLPHUS W., PhG., M.A.,
Ph.D.,
400 N. 3rd st., Philadelphia, Pa.
- Miller, Albert, Ph.G.,
2058 Lincoln ave., Chicago, Ill.
- Miller, Bernard,
178 Brook ave., New York, N. Y.
- Miller, Chas.,
U. S. M. Hosp., Key West, Fla.
- Miller, Chas. E.,
Albion, Ind.
- Miller, David,
1 Gates ave., Brooklyn, N. Y.
- Miller, Edwin A., B.Pd., Ph.G.,
222 Bellevue st., Cape Girardeau,
Mo.
- MILLER, EMERSON R., PhC., B.S.,
M.S., PHAR.M.,
214 N. Murray st., Madison, Wis.
- Miller, F. W.,
Amana, Ia.
- Miller, I. B.,
5-7 Main st., Cape Girardeau, Mo.
- Miller, Ivy L.,
340 Downey ave., Indianapolis, Ind.
- Miller, Joseph J.,
525 3rd ave., Pittsburgh, Pa.
- Miller, Robert Jacob,
Residence Unknown.
- Miller, Turner A., Ph.G.,
519 E. Broad st., Richmond, Va.
- Minehart, John R.,
4821 Germantown ave., Phila-
delphia, Pa.
- MINER, MAURICE A., PHAR.M.,
6446 University ave., Chicago, Ill.
- Missildine, Ernest E., A.B.,
Box 116, Tyron, N. C.
- Mitchell, Lloyd B.,
3401 Wendelkin st., Dallas, Tex.
- Mitschele, Albert H.,
115 Palisade ave., Jersey City,
N. J.
- Mitschkun, Mark,
576 Hastings, Detroit, Mich.
- Mittelbach, Wm., Ph.G.,
413 5th st., Boonville, Mo.
- Moerk, Frank X., Ph.G., Ph.M.,
145 N. 10th st., Philadelphia, Pa.
- Molitor, Martin,
702 St. Germain st., St. Cloud,
Minn.
- Mollet, Chas. E. F., Ph.C.,
1321 Helen ave., Missoula, Mont.
- Monakey, Leon C.,
Tupper Lake, N. Y.
- Monnier, Ernest,
157 Federal st., Boston, Mass.
- Monroe, Harley R.,
c. Orange Hotel, Tampa, Fla.
- Monroe, Roger E.,
500 W. Broad st., Richmond, Va.
- Montgomery, W. R.,
140 W. Park st., Butte, Mont.
- Moonves, Jacob B.,
1172 Vyse ave., New York, N. Y.
- Moore, Alexander Benjamin Jour-
neaux,
P. O. Box 1558, Montreal, Canada.
- Moore, Maxwell S.,
Fowler, Mich.
- Moore, John T.,
932 Rhode Island st., Lawrence,
Kans.
- Moran, Rose,
5450 Angora Terrace, Philadel-
phia, Pa.
- Morgan, Ashton H., Dr.,
361 E. Market st., Wilkes-Barre,
Pa.
- MORGAN, AYLMER L.,
Washington & Adams sts., Cam-
den, Ark.
- Morgan, Chas.,
402 Roland ave., Roland Park
Pharmacy, Baltimore, Md.
- Morgan, Charles Levin,
Half Moon Bay, Cal.
- Morgan, David Elias, Dr.,
Phoenix City, Ala.
- Morgan, Frank E., Ph.G., Ph.D.,
1629 Walnut st., Philadelphia, Pa.
- Morgan, Geo. S.,
72 Cottage st., Pawtucket, R. I.
- Morgan, Jos. D.,
236 Horton st., Wilkes-Barre, Pa.

- Morgan, Richard Franklin,
139 W. Oakwood Place, Buffalo,
N. Y.
- Morgan, William F., Phar.D.,
Silver Lake Pharmacy, Baldwin,
L. I., N. Y.
- Morland, Robert L.,
Worthington, Minn.
- Morris, Henry,
Michigan ave. & Grand st., Lansing,
Mich.
- MORRIS, LEMUEL I.,
Eddystone, Delaware Co., Pa.
- Morrison, James W.,
540 W. Randolph st., Chicago, Ill.
- Morrison, Warren Dale,
6026 Drexel ave., Chicago, Ill.
- Mortenson, Frank E., Ph.G.,
24th & Grand, Pueblo, Colo.
- Mosher, Donavan D.,
Carney's Point, N. J.
- Moyer, A. E.,
32 Adams ave., W. Detroit, Mich.
- Moyer, Harry T.,
5756 Chicago ave., Chicago, Ill.
- Mozielleff, Samuel,
1060 Forest ave., New York, N. Y.
- Mrazek, Leo Ludwig,
1500 W. 18th st., Chicago, Ill.
- Muehlhause, Otto W.,
1517 E. Fort ave., Baltimore, Md.
- Mueller, Ambrose,
Bristol Bldg., Webster Groves,
Mo.
- Mueller, Frank F.,
Reedsburg, Wis.
- Mueller, Fred A.,
2129 University ave., Berkeley,
Cal.
- Mueller, J. Geo.,
101 S. Meridian st., Indianapolis,
Ind.
- Mueller, Norbert R.,
Bureau of Plant Industry, Wash-
ington, D. C.
- Mueller, Otto E.,
970 Baxter ave., Louisville, Ky.
- Muench, Albert August,
608 N. Salina st., Syracuse, N. Y.
- Muench, Wm.,
608 N. Salina st., Syracuse, N. Y.
- Muhlberg, Victor Charles,
1800 Race st., Cincinnati, O.
- Muhlhan, Otto E.,
10500 Cedar ave., Cleveland, O.
- Muldoon, Hugh C., Ph.G.,
Mass. Coll. of Pharm., Boston,
Mass.
- Mulet, Luis,
11th ave. August No. 74, P. O.
Box 454, Mayaguez, Porto
Rico.
- Mulford, Henry K.,
Wayne, Pa.
- Mulford, Henry Kendall, Jr.,
212 Pembroke ave., Wayne, Pa.
- Mullen, Albert E.,
2482 Valentine ave., New York,
N. Y.
- Mulrean, Anna E.,
2631 Harriet ave., S., Minne-
apolis, Minn.
- Munson, James G.,
12 S. 1st st., San Jose, Cal.
- Murdy, William Fletcher, D.D.S.,
Pharmacist U.S.N., U. S. Naval
Hospital, Norfolk, Va.
- Murphey, E. G.,
East Las Vegas, N. M.
- Murphy, Dennis E.,
1053 S. Gregory st., Cincinnati, O.
- Murphy, John B.,
Pelican & Pacific aves., Algiers,
New Orleans, La.
- Murray, Alex., ex-Pres. Coll. Pharm.
of Costa Rica,
San Jose de Costa Rica, C. A.
- Murray, Benj. L., Ph.C., B.S., A.M.,
c. Merck & Co., Rahway, N. J.
- Muth, George G.,
309 N. Carey st., Baltimore, Md.
- Muth, John C.,
23-25 S. Charles st., Baltimore, Md.
- Nagin, Eugene,
609 E. 170th st., Bronx, New
York, N. Y.
- Nagle, Edward G.,
35 Washburn ave., North Cam-
bridge, Mass.

- Nance, O. J.,
Jackson, Tenn.
- Nankivell, John H.,
Captain 157th U. S. Inf., 415
S. Williams st., Denver, Colo.
- Nau, Frank,
141 6th st., Portland, Ore.
- Naviaux, Ernest Louis,
26 S. Crawford ave., Chicago, Ill.
- Neal, Chas. C.,
301 W. Pratt st., Baltimore, Md.
- Nebig, Wm. G., Ph.G.,
2143 N. 18th st., Philadelphia, Pa.
- Needham, John W.,
Finley, N. Dak.
- Neilson, John,
Ortonville, Minn.
- Nelligar, Fred D.,
400 Church st., Norfolk, Va.
- Nelson, Edwin H.,
Brooklyn & Lafayette aves., De-
troit, Mich.
- Nelson, John,
Lake Park, Minn.
- Nelson, William,
Residence Unknown.
- Neninger, Fred Martin,
1017 Rogers ave., Brooklyn, N. Y.
- Nesbitt, Evelyn (Mr.),
597 Sherbrooke st., Winnipeg,
Man., Can.
- Nester, Herman A., Ph.G.,
529 San Pedro ave., San Antonio,
Tex.
- Nesy, Albert,
2245 E. 105th st., Cleveland, O.
- Netz, Charles Vail,
321 12th ave., S. E., Minne-
apolis, Minn.
- Neu, Daniel A.,
145 Palisade ave., West Ho-
boken, N. J.
- Neumann, John H.,
Lewiston, Minn.
- Neville, William R.,
Griffith Drug Co., Scarborough
Bldg., Austin, Texas.
- Nevin, Thos.,
Box 23, Grand Central Sta.,
110 E. 45th st., New York, N. Y.
- Newcomb, Edwin L., P.D.,
719 6th ave., S. E., Minneapolis,
Minn.
- Newley, Thomas S.,
Ventura, Calif.
- NEWMAN, GEO. A.,
1123 3rd st., Louisville, Ky.
- Newton, Clark H. W.,
63 Bank st., Waterbury, Conn.
- Newton, Howard C.,
c. Creighton College of Pharmacy,
Omaha, Neb.
- Newton, Robert A.,
P. O. Box No. 1254, c. Internal
Rev. Agt., Pittsburgh, Pa.
- Nichols, Adley Bonisteel,
145 N. 10th st., Philadelphia, Pa.
- Nichols, C. Verne,
408 E. Main st., Anadarko, Okla.
- Nielson, Paul Edward,
Railroad & Washington ave.,
Hillsdale, N. J.
- Niles, Edward Hulbert,
725 Century Bldg., Indianapolis,
Ind.
- Nish, Frederick William,
22 Parnassus ave., San Fran-
cisco, Calif.
- Nitardy, Fred. Wilhelm, Ph.G., Ph.C.,
66 Orange st., Brooklyn, N. Y.
- Nixon, Chas. F., Ph.G.,
No. 1 Park st., Leominster, Mass.
- Noble, Clifford Arthur,
84 Broad st., Lyons, N. Y.
- Noble, J. Merner,
500 N. Commercial st., St. Louis,
Mo.
- Noel, Harry Sumner,
3124 Kenwood ave., Indianapolis,
Ind.
- Nolan, Joseph John,
420 Britton ave., Concord, S. I.,
N. Y.
- Noll, Mathias,
627 Commercial st., Atchison,
Kans.
- Noonan, Harry,
Pres. The Products Inc. Drug,
48 W. 4th st., New York, N. Y.

- Norris, Wm. Peter,
2509 Western ave., Peoria, Ill.
- Norton, Geo.,
R. D. No. 1, Dallas, Pa.
- Norton, Geo. E.,
102 River st., Cambridge, Mass.
- Novack, Harry J., M.D.,
N. E. cor. 32d & Diamond sts.,
Philadelphia, Pa.
- Noyes, Chas. R., B.A.,
400 Sibley st., St. Paul, Minn.
- Nuccio, Frank Joseph,
1040 Dauphine st., New Orleans,
La.
- Nutter, Albert M.,
2300 Marengo st., New Orleans,
La.
- Oats, Charles A.,
658 9th ave., Cor. 46th st., New
York, N. Y.
- O'Brien, James M.,
3730 Washington st., Boston,
Mass.
- Oca, Rene R.,
Separacion 40, Santo Domingo
City, Dominican Republic.
- Ocheret, Rebecca (Miss),
766 Coney Island ave., Brooklyn,
N. Y.
- O'Connell, Margaret,
1009 University ave., S. E.,
Minneapolis, Minn.
- O'Gorman, Theophilus,
Port Townsend, Wash.
- O'NEIL, HENRY M.,
314 W. 14th st., New York, N. Y.
- OHLIGER, LOUIS P.,
75 Medbury ave., Detroit, Mich.
- Ohliger, Willard,
c. Fred'k Stearns & Co., Detroit,
Mich.
- O'Kane, Eugene Tracy,
299 Willis ave., New York, N. Y.
- OLESON, OLAF M.,
Ft. Dodge, Ia.
- Olive, Geo. M.,
1865-1867 Mass. ave., N., Cam-
bridge, Mass.
- OLIVER, WILLIAM M.,
132 Broad st., Elizabeth, N. J.
- Olmstead, David M.,
69 Ardmore st., Rochester, N. Y.
- Olson, Ferdinand P.,
Box 85, Mobridge, S. D.
- O'Neill, Wm.,
337 W. Madison st., Chicago, Ill.
- Orr, Edward Emery, Jr.,
106 Lynnway, Point of Pines,
Revere, Mass.
- Osborne, Melmoth M.,
Elkins Park, Pa.
- Osseward, Cornelius, Ph.C.,
Cobb Bldg., Seattle, Wash.
- Osterlund, Otto Wm.,
46th st. & Balto ave., Philadel-
phia, Pa.
- Osterman, Henry,
212 S. Walnut st., Seymour, Ind.
- Ostrander, Clarence Edward,
326 Clinton ave., Albany, N. Y.
- Ostrosky, Frank J.,
646 Pembroke st., Bridgeport,
Conn.
- Ott, Bertha (Miss),
Reading Road & Oak st., Avon-
dale, c. Bethesda Hospital, Cin-
cinnati, O.
- Owen, Charles Herbert,
U. S. Navy Aero Station, Pensa-
cola, Fla.
- Owens, Evan R.,
345 E. Market st., Wilkes-Barre, Pa.
- Owens, William H.,
341 Cummuniapaw ave., Jersey
City, N. J.
- Pace, Homer S.,
30 Church st., New York, N. Y.
- Pachali, Theo., Jr.,
1501 Locust st., Philadelphia, Pa.
- Pachuta, Michael,
204 East ave., Mt. Carmel, Pa.
- Packard, Chas. H.,
7 Central Square, E. Boston, Mass.
- Pakchar, Julius M.,
367 S. 2d st., Brooklyn, N. Y.
- Palmer, Gertrude M.,
Grace Hospital, Cor. John R. &
Willis ave., Detroit, Mich.
- Palmer, Wm. G.,
Fowler, Colo.

- Paolantonio, John,
 310 Gilbert st., Utica, N. Y.
 Paris, James E., Ph.G.,
 Paragould, Ark.
 Parisen, Geo. W.,
 321 High st., Perth Amboy, N. J.
 Parker, Fred M.,
 364 Wabash ave., St. Paul, Minn.
 Parker, Gilbert R.,
 22 Pocasset ave., Providence, R. I.
 Parker, Mayne E.,
 1902 Bellefontaine st., Indian-
 apolis, Ind.
 Parker, Ray M.,
 2521 Floyd ave., Richmond, Va.
 Parker, William Frank,
 51 W. 37th st., New York, N. Y.
 Parker, William S.,
 Lisbon, N. D.
 Partos, N. C.,
 160 Second ave., New York, N. Y.
 Partridge, Frank R.,
 Water st., Augusta, Me.
 PATCH, EDGAR L., PhG.,
 28 Lincoln, Stoneham, Mass.
 Patch, James A.,
 Syrian Prot. College, Beirut,
 Syria.
 Patella, Carmela,
 353 First st., Jersey City, N. J.
 Patterson, Annie M.,
 2900 W. Lake Place, Denver,
 Colo.
 Patterson, Chas. W.,
 2431 S. Dearborn st., Chicago, Ill.
 Patterson, Geo. O., Ph.G.,
 Hawesville, Ky.
 Patterson, James Numa,
 10 Center st., Santa Cruz., Cal.
Patterson, Theo. H.,
 3640 Cottage Grove ave., Chi-
 cago, Ill.
 Patterson, James Wilburn,
 Oak Cliff Pharmacy, Dallas, Tex.
 Pauley, Alfred Washington,
 3130 N. Grand ave., St. Louis,
 Mo.
 PAULEY, FRANK C.,
 939 Ailanthus ave., St. Louis, Mo.
- Payne, Geo. F., M.D.,
 50 Bonaventure ave., Atlanta, Ga.
 Pazos y Boada Felipe,
 27 entre Ay Paseo Vedado, Ha-
 vana, Cuba.
 Peacock, Bertha L. (Mrs.), Ph.G.,
 Erie & Broad sts., Germantown,
 Philadelphia, Pa.
 Peacock, Josiah C., Ph.G.,
 Erie & Broad sts., Philadelphia,
 Pa.
 Pearce, Geo. E.,
 21 West Union, Frostburg, Md.
 Pearce, Howard A.,
 370 Elmwood ave., Providence,
 R. I.
 Pearre, Albert L.,
 18 S. Market st., Frederick, Md.
 Pearson, Wm. A., M.D.,
 209 N. 50th st., Philadelphia, Pa.
 Pease, Autumn V.,
 408 Fourth st., Fairbury, Neb.
 Peat, Clarence A.,
 70 Woodlawn ave., Norwalk, Ohio.
 Peckham, Wm. G.,
 1100 W. 37th st., Chicago, Ill.
 Pedroni, Lawrence E.,
 1636 Melville st., New York, N. Y.
 Pegg, George W.,
 113 W. 18th st., New York, N. Y.
 Pellerano, Nicholas A.,
 35 S. 1st st., San Jose, Cal.
 Pence, August Fred,
 1534 Lakeland av., Lakewood, Ohio.
 Pendleton, Clarence Isaac,
 101 Brighton ave., Allston, Mass.
 Penick, S. Barksdale,
 256 Front st., New York, N. Y.
 Perkins, George H.,
 50 Water st., North Andover,
 Mass.
 Perrin, D. Edmund,
 1876 Grand River ave., Detroit,
 Mich.
 Perry, Fred W. R., Ph.C.,
 709 Woodward ave., Detroit,
 Mich.
 Perry, William George,
 301 12th st., Miami, Florida.

- Perusse, Francis Joseph,
1085 Lincoln Pl., Boulder, Colo.
- Peska, Alexander C.,
1539 N. Hamlin ave., Chicago, Ill.
- Peters, Henry A., M.D., Ph.G.,
200 N. Main st., Oconomowoc,
Wis.
- Peterson, Alex F.,
216 Higgins ave., Missoula, Mont.
- Petretti, Oreste,
557 Fordham Road, Bronx, New
York, N. Y.
- Petsche, Franz F. B. W.,
Arlington Chem. Co., Yonkers,
N. Y.
- Petterson, Ernst W.,
25 S. Palafox st., Pensacola, Fla.
- Pexton, Frederic Schuyler,
Irwin, Ia.
- Pfafflin, Henry A.,
3711 E. Washington st., Indian-
apolis, Ind.
- Pfeiffer, Gustavus A.,
113 W. 18th st., New York, N. Y.
- Pfeiffer, John,
144 W. Commerce st., San An-
tonio, Texas.
- Philip, Waldemar Bruce,
1410 Fruitdale ave., Oakland,
Cal.
- Phillips, Wendell E.,
Residence Unknown.
- Phipps, Morris,
620 N. 6th st., Richmond, Va.
- Pieck, Edw. L.,
6th & Main sts., Covington, Ky.
- Pierce, Fred D.,
Barton, Vt.
- PIERCE, WM. H.,
316 Shawmut ave., Boston, Mass.
- Piercy, Joseph C.,
Tonapah, Nevada.
- Pierson, Romaine,
81-83 Fulton st., New York, N. Y.
- Pigott, Charles Dewitt,
c. Mrs. M. E. Pigott, R. F. D.
No. 7, Tylertown, Mass.
- Pilkington, George R.,
Pittsboro, N. C.
- Pillsbury, Arthur Lee,
Box 749, Denver, Colo.
- Pinkerton, Howard,
81 Grand River ave., Detroit,
Mich.
- Pinks, Charles H.,
13 West Main st., Meriden, Conn.
- Pinter, Edmund D.,
100 Danforth ave., Jersey City,
N. J.
- Pirie, Alfred M.,
Cartago, Calle Real, Costa Rica,
C. A.
- PRIT, JOHN R.,
218 Main st., Middletown, Conn.
- Pittenger, Paul S., Ph.G., Ph.C.,
Phar.D.,
426 S. 13th st., Philadelphia, Pa.
- Placak, Harry, Ph.G.,
3625 Woodbridge ave., Cleveland,
Ohio.
- Planten, H. Rolff,
93 Henry st., Brooklyn, N. Y.
- Plaut, Edward,
120 William st., New York, N. Y.
- Plenge, Henry,
8 Broad st., Charleston, S. C.
- Plette, G. W. Lloyd,
1413 9th ave., Altoona, Pa.
- Plummer, R. M.,
260 Third st., Portland, Ore.
- Podolsky, Reuben,
1301 Wilkins ave., New York, N. Y.
- Poehner, Adolph Adam, Ph.G., M.D.,
1517b Golden Gate ave., San
Francisco, Cal.
- Poley, Warren H.,
33 E. Upsal st., Mt. Airy, Phila-
delphia, Pa.
- Pollock, Henry,
649 Prospect st., E., Cleveland, O.
- Pool, James Arthur,
107 S. Humboldt ave., Redfield,
S. D.
- Pope, Alvah J.,
Cor. Central ave. & E. 33rd st.,
Cleveland, O.
- Porter, Chilton Scott,
430 E. Maxwell st., Lexington,
Ky.

- Porter, G. Ellis, A.B.,
c. Porter's Pharm., Cor. 8th &
Orange sts., Riverside, Cal.
- PORTER, HENRY C.,
Main & Pine sts., Towanda, Pa.
- Porter, James S.,
1254 Salem ave., Hillside,
c. Elizabeth P. O., N. J.
- Porter, Jesse G.,
Tipton, Ind.
- Porter, Martin L., M.D.,
Danforth, Me.
- Porter, Wm. P.,
Belgrade, Mont.
- Porterfield, Wm. P., Ph.G.,
61 Broadway, Fargo, N. D.
- Possehl, John J.,
1102 Wells st., Milwaukee, Wis.
- Potter, Maynard H., Ph.G., Ph.C.,
Piggott, Ark.
- Potts, Thos. H.,
Room 439, 122 S. Michigan Blvd.,
Chicago, Ill.
- Powell, Wm. C.,
119 Green st., Snow Hill, Md.
- POWER, FREDERICK B.,
Bureau of Chemistry, Washing-
ton, D. C.
- Prassel, Frank,
902 Nolan st., San Antonio, Tex.
- Prichard, Leslie Eldridge,
6437 Alabama ave., St. Louis, Mo.
- Prieto, Jose Ramon,
Agramonte 22, Cruces, Cuba.
- Prince, Clofton O.,
Winchester, Tenn.
- Pritchard, Benj. E.,
918 Bessemer Bldg., Pittsburgh,
Pa.
- Pritchard, Frederick R.,
232 Chestnut st., Kingston, Pa.
- Pruyn, Murry K.,
1431 N. La Salle st., Indianapolis,
Ind.
- Puckner, Wm. A., Ph.G., Phar.D.,
535 N. Dearborn ave., Chicago,
Ill.
- Pully, Luther S.,
1621 Church st., Nashville, Tenn.
- Purdy, Harrison E.,
100 Elizabeth st., Derby, Conn.
- Purel, Victor Honore,
2936 Ursuline ave., New Orleans,
La.
- Pursell, Robert C.,
280 Pearl st., New York, N. Y.
- Putt, Earl B.,
9 Canfield Apts., Market st. &
Deleson ave., Youngstown, O.
- Quackenbush, Benj. F.,
703 Greenwich st., New York,
N. Y.
- Quigley, Richard L.,
2036 G st., N. W., Washington,
D. C.
- Quin, Harry J.,
187 Bloomfield ave., Newark,
N. J.
- Rabak, Frank,
Bureau Plant Industry, Wash-
ington, D. C.
- Rabenstein, Edward, Jr.,
1761 E. 55th st., Cleveland, O.
- Rabinowitz, Abraham,
931 Fairmount ave., Philadelphia,
Pa.
- Rabinowitz, Harry,
353 Vernon ave., Brooklyn, N. Y.
- Rabinowitz, Wm. J.,
Simonton, Texas.
- Raeuber, Edw. G.,
49 Biddle st., Milwaukee, Wis.
- Ramsaur, David W.,
303 Park st., Jacksonville, Fla.
- Randolph, Raymond B. F.,
831 Cartaret ave., Trenton, N. J.
- Rankin, George W.,
107 Congress st., Portland, Me.
- Rapoport, Julius G.,
N. W. Cor. Front & Christian sts.,
Philadelphia, Pa.
- Raubenheimer, Otto, Ph.G., Phar.D.,
Ph.M.,
1341 Fulton st., Brooklyn, N. Y.
- Rauchfleisch, Edward C.,
13864 Euclid ave., Cleveland, O.
- Rauschert, Emil P.,
2303 Lincoln ave., Chicago, Ill.

- Rawls, Imaon Cooper,
 Residence Unknown.
 Rawls, William Andrew,
 25 S. Palafox, Pensacola, Fla.
 Raynor, W. Clifford,
 Westhampton, N. Y.
 Reed, James G.,
 14300 Euclid ave., East Cleve-
 land, O.
 Reed, John Edwin,
 700 Main st., Gallitzin, Pa.
 Reese, David J.,
 17th & Huntingdon sts., Philadel-
 phia, Pa.
 Rehfuß Chas.,
 1301 Columbus ave., Philadelphia,
 Pa.
 Rehfuß, Jacob H.,
 252 Sumner ave., Brooklyn, N. Y.
 Reick, Edward C.,
 3201 Central ave., Indianapolis,
 Ind.
 Reif, Ernest,
 1251 N. Second st., Philadelphia,
 Pa.
 Reige, Flower H.,
 77 Van Duzer st., Tompkinsville,
 N. Y.
 Reilly, Robert C.,
 Box 1516, Los Angeles, Calif.
 Reimann, Geo.,
 405 Genesee st., Buffalo, N. Y.
 Rein, Tania,
 Tacoma General Hospital, Ta-
 coma, Wash.
 Reiner, Nicholas F.,
 Box 1286, 25 Westminster Place,
 Providence, R. I.
 Reiser, Philip,
 18 E. 51st st., Bayonne, N. J.
 Ramirez, Prof. Francisco,
 Jesus del Monte San Indelecio y
 Santa Irene letra C, Havana,
 Cuba.
 Reyer, Emil, Ph.G.,
 614 Portage ave., South Bend,
 Ind.
 Rhea, Howard M.,
 c. Revenue Agent, Huntington,
 W. Va.,
 Rhode, Rudolph E.,
 1301 N. Clark st., Chicago, Ill.
 Rhodehamel, Harley Wesley,
 3323 College ave., Indianapolis,
 Ind.
 Rhodes, Charles Reynolds,
 Hyndman, Pa.
 Rhodes, George W.,
 Newark, Del.
 Ria Coy, Naftul-Herz,
 1525 Washington ave., Bronx,
 New York, N. Y.
 Rich, Wm. P.,
 Pros. & Pease aves., Verona, N. J.
 Richardson, Frank, Ph.G.,
 Cambridge, N. Y.
 Richardson, Gerald Arthur,
 152 Virginia ave., Jersey City, N. J.
 Richardson, Willard S.,
 14th & R sts., N. W., Washing-
 ton, D. C.
 Richtmann, Wm. O., Ph.G., B.S.,
 1721 Van Hise ave., Madison,
 Wis.
 Ricketts, John G.,
 323 N. Washington st., Wilkes-
 Barre, Pa.
 Riefflin, Geo. T.,
 41 John st., New York, N. Y.
 Riemenschneider, J. H.,
 2916 Broadway, Chicago, Ill.
 Riesen, David V.,
 Marysville, Kans.
 Rietzke, Herman W.,
 380 Selby ave., St. Paul, Minn.
 Rike, Zeb. W.,
 Farmersville, Texas.
 Ring, Harry E.,
 Yarmouth, Me.
 Ripley, Henry M.,
 531 Main st., Melrose, Mass.
 Rippetoe, John R., P.D.,
 570 E. 133rd st., New York, N. Y.
 Ritchie, Margaret (Miss),
 71¹/₂ S. 10th st., Newark, N. J.
 Riter, Benj F.,
 33 N. Main st., Logan, Utah.
 Ritter, Walter A.,
 c. Miss Frances Ritter, 629
 Peosta ave., Helena, Mont.

- Roan, Patrick A.,
159 E. Main st., Plymouth, Pa.
- Roberts, John Griffith,
1634 N. 62d st., Philadelphia, Pa.
- Roberts, Joseph C.,
24 E. Woodland ave., Arlington,
Md.
- Robertson, John H.,
Duncansville, Pa.
- ROBINSON, JAMES S.,
2nd & Madison sts., Memphis,
Tenn.
- Rockefeller, Howard,
24 West Park st., Butte, Mont.
- Roddy, John A., M.D.,
c. John B. Waltz, 52d & Market
sts., Philadelphia, Pa.
- Rodemoyer, Wm. E.,
773 Hazelwood ave., Pittsburgh,
Pa.
- Rodriqueza, Rene,
Separacion 113 Sante Domingo
City, Dominion, Rep.
- Roedel, Andrew Edward,
312 N. 17th st., Cheyenne, Wyo.
- Roediger, Louis F., Ph.G.,
46 Market st., New York, N. Y.
- Roehr, Clarissa M. (Miss),
2nd & Parnassus ave., U. H., San
Francisco, Cal.
- Roehrig, Albert M., Ph.G.,
U. S. M. Hospital, Savannah, Ga.
- Roesener, Walter C.,
Hotel Mayer, Peoria, Ill.
- Rogers, Charles Herbert,
Univ. of Minn., Minneapolis,
Minn.
- Rogers, Edw.,
U. S. Marine Hosp., Chelsea, Mass.
- Rogers, Fred S.,
30 North st., Middletown, N. Y.
- Rogers, Russell V.,
1200 Main st., Dallas, Texas.
- ROGERS, WM. H.,
North st., Middletown, N. Y.
- Rohnert, Frederick,
455 Jefferson ave., Detroit, Mich.
- Rohrman, Frank Randall,
4603 Wayne ave., Philadelphia,
Pa.
- Roller, Emil, Ph.G.,
574 Amsterdam ave., New York,
N. Y.
- Roon, Leo,
23 Vine st., c. E. R. Squibb &
Sons, Brooklyn, N. Y.
- Rooney, James P.,
355 S. River st., Wilkes-Barre, Pa.
- Root, Charles T.,
806 Lennox Apts., Detroit, Mich.
- Root, Wilfred F.,
133 Main st., Brattleboro, Vt.
- Rose, Ira W., Ph.G.,
102 N. Main st., Rocky Mountain,
N. C.
- Rose, William Wilson,
Smyrna, Delaware.
- Rosenberg, Julius Jacob,
1965 N. 31st st., Philadelphia, Pa.
- Rosengarten, Adolph G.,
Box 1625, Philadelphia, Pa.
- Rosengarten, Frederick,
9th & Parrish sts., Philadelphia, Pa.
- Rosengarten, Geo. D.,
P. O. Box 1625, Philadelphia, Pa.
- Rosengarten, J. G., Jr.,
9th & Parrish sts., Philadelphia,
Pa.
- Rosenthal, David A., Ph.G.,
521 Gay st., Knoxville, Tenn.
- Rosenzweig, Benj.,
495 8th st., Brooklyn, N. Y.
- Rosin, Joseph,
9th & Parrish sts., Philadelphia,
Pa.
- Ross, Otto E., Ph.C., Ph.G.,
Conde, S. D.
- Rotegard, Bernard C.,
Hartland, Minn.
- Rothwell, Walter,
Hatboro Pa.
- Rovin, Alexander M.,
3334 Jefferson st., E., Detroit,
Mich.
- Rovno, Leon,
Residence Unknown.
- Rowe, Lewis W.,
169 Vancouver ave., Detroit,
Mich.

- Rowlinski, Robert A.,
Box 595, Savannah, Ga.
- Rubenstein, Louis,
Joshua Green Bldg., 4th & Pike
sts., Seattle, Wash.
- Rudd, Wortley Fuller,
1716 Grove ave., Richmond, Va.
- Rudder, Wm. H.,
3 Lyons Block, Salem, Ind.
- Ruddiman, Edsel A., Ph.C., Ph.D.,
M.D.,
1916 Adelia st., Nashville, Tenn.
- Ruddy, Joseph Michael,
5 Keyes st., Warren, Mass.
- Ruder, Rose Schule (Mrs.),
1101 Berwyn ave., Chicago, Ill.
- Rudolph, Mrs. Bertha,
1501 Perm st., St. Joseph, Mo.
- Ruenzel, Henry G.,
2332 Vliet st., Milwaukee, Wis.
- Ruf, Frank A.,
1624 Pine st., St. Louis, Mo.
- Ruhl, Harry F.,
Manheim, Lancaster Co., Pa.
- Runkel, Julia,
38 S. Dearborn st., Room 643,
1st Nat'l Bk. Bldg., Chicago,
Ill.
- RUNYON, EDWARD W.,
200 Sixth ave., New York, N. Y.
- Rupert, Jonas F.,
H. S., U. S. S. Virginia, c. Post-
master, New York, N. Y.
- Rupp, Walding G. (Dr.),
21 Kenilworth, Toledo, Ohio.
- Ruppe, Bernard C.,
203 Central ave., Albuquerque,
N. M.
- Rusby, Henry H.,
776 De Graw ave., Newark, N. J.
- Russell, C. Allen,
State College, Pa.
- Russell, Hamilton,
212 S. Palafox st., Pensacola, Fla.
- Russell, Hugh C.,
914 Lakeside st., Chicago, Ill.
- Rutkin, Charles Paul,
Morris ave., Springfield, N. J.
- Ryan, Alonzo S.,
Box 1140, Denver, Colo.
- Ryan, Ambrose E.,
P. O. Box 93, El Paso, Tex.
- Ryan, Frank G.,
c. Parke, Davis & Co., Detroit,
Mich.
- Saalbach, Carl, Ph.G.,
1436 5th ave., Pittsburgh, Pa.
- Saalbach, Louis, Ph.G., Phar.D.,
432 Ruxton st., Pittsburgh, Pa.
- Saccar, Michael, Ph.G.,
City Drug Store, Hallettsville, Tex.
- Sadtler, Samuel P.,
210 S. 13th st., Philadelphia, Pa.
- Salb, Oscar G.,
c. Jno. T. Milliken & Co., St.
Louis, Mo.
- Salinas, Miguel Saavedra,
16 Principal st., Ceiba, Porto
Rico.
- Salm, Louis N.,
259 W. 130th st., New York,
N. Y.
- Sampanis, Argiris Georges,
179 Warren ave., Boston, Mass.
- Samson, Max,
117 Camp st., New Orleans, La.
- Samsonoff, Joseph,
1489 Vyse ave., New York, N. Y.
- Sanchez, Miguel,
Media Luna, Oriente, Cuba.
- Sanders, Harry Benjamin,
Wyoming, Ohio.
- Sandles, Van Amburg,
1000 Charles ave., McKees Rocks,
Pa.
- Saphiro, Isadora,
173 ave. B, New York, N. Y.
- Sarlo, Joseph,
5715 Baynton st., Germantown,
Pa.
- Sass, Stephen K.,
1725 W. 18th st., Chicago, Ill.
- Sauer, Leafy A. (Miss),
South Side Hospital, Pittsburgh,
Pa.
- Sauvinet, Chas. D.,
Cor. 9th & Vermont, Los Angeles,
Cal.
- SAYRE, EDW. A.,
482 Broad st., Newark, N. J.

- Sayre, Lucius E.,
Univ. of Kansas, Lawrence, Kans.
- Scallin, Stephen H.,
Mitchell, S. D.
Schaak, Milton F.,
710 Victoria st., Corona, Cal.
- Schachleiter, Frank,
Box 97, Little Rock, Ark.
- Schaefer, Chas. H., Ph.G.,
3906 Perrysville ave., Pittsburgh, Pa.
- Schaefer, Emil A., P.D.,
1436 5th ave., Pittsburgh, Pa.
- Schaefer, Frederick,
190 Nassau ave., Brooklyn, N. Y.
- Schaefer, Hugo H.,
115 W. 68th st., New York, N. Y.
- SCHAEFER, GEO. H.,
713 Front st., Ft. Madison, Ia.
- Schaupner, John Philip,
399 Linwood ave., Detroit, Mich.
- Scheddell, William Allen,
104 S. Main st., Crown Point, Indiana.
- Schenk, Fannie K. (Mrs.),
Louviers, Colo.
- Scherer, Andrew, Ph.G.,
1201 N. State st., Chicago, Ill.
- SCHERLING, GUSTAV, Ph.G.,
1201 4th st., Sioux City, Ia.
- Schertz, Christian,
1341 Elysian Fields ave., New Orleans, La.
- Schettler, Geo. M.,
263 Woodward ave., Detroit, Mich.
- Scheuber, Frank A.,
P. O. Box 663, Livingston, Mont.
- Schick, Sebastian Fabian,
Suite 317 Woodruff Bldg., Joliet, Ill.
- Schieffelin, Wm. Jay, M.D.,
170 William st., New York, N. Y.
- Schiff, Ludwig,
c. Western Wholesale Drug Co.,
Box 697, Los Angeles, Cal.
- Schimpf, Henry William,
443 W. 34th st., New York, N. Y.
- Schindel, David P.,
47 S. Potomac st., Hagerstown, Md.
- Schlabach, Cyrus L.,
437 Northampton st., Easton, Pa.
- Schlesinger, Leopold J.,
109 Ashburton ave., Yonkers, N. Y.
- Schlichting, Arthur Floyd,
Agricultural College, Fargo, N. D.
- Schlicke, Carl Paul,
440 Washington st., New York, N. Y.
- Schlotterbeck, Augustus G.,
36 Brown st., Portland, Me.
- Schlueter, Robert E., Ph.G., M.D.,
514 Metropolitan Bldg., St. Louis, Mo.
- Schlumberger, Anna B.,
Denison, Ia.
- Schlumberger, Philip A.,
122 Broadway, Denison, Ia.
- Schmid, Rose P.,
2133 S. Halsted st., Chicago, Ill.
- Schmidt, Adolph,
330 5th ave., McKeesport, Pa.
- Schmidt, A. Elsa,
303 Columbia Terrace, Peoria, Ill.
- Schmidt, Florian Joseph,
7904 Stony Island ave., Chicago, Ill.
- Schmidt, Henry,
501 Elizabeth ave., Elizabeth, N. J.
- Schmidt, Valentine, B.S., M.S., M.D.,
Ph.D.,
1845 Polk st., San Francisco, Cal.
- Schmidts, Carl L.,
2524 Milvia st., Berkeley, Cal.
- Schmitter, Jonathan,
Gypsum, Kansas.
- Schneider, Albert, B.S., M.S., M.D.,
Ph.D.,
2nd & Parnassus ave., San Francisco, Cal.
- Schnell, Harry J.,
100 William st., New York, N. Y.
- Schneller, J. Max A.,
111 Wall st., New York, N. Y.
- Schobert, Rudolph Johannes,
3401 Fullerton Ave., Chicago, Ill.
- Schoen, Mrs. R.,
Hill City, Minn.

- Schoenenberger, August,
1123 Centre St., Ashland, Pa.
- Schoenholzer, Emil,
Kelly Field No. 1, c. Med. Dept.,
San Antonio, Texas.
- Schoenhut, Christian H.,
14223 Detroit ave., Lakewood,
Ohio.
- Schoenthaler, John P.,
3530 Pestalozzi ave., St. Louis,
Mo.
- Schollenberger, William Watts,
2124 Cliftwood Av., Baltimore, Md.
- Scholtz, Edmund L.,
1001 16th st., Denver, Colo.
- Scholtz, William O.,
Box 1140, Denver, Colo.
- Scholz, Oscar R. B.,
131 Hamburg Place, Newark, N. J.
- Schott, Ernest John,
Cor. Broadway & 8th ave., Nash-
ville, Tenn.
- Schrage, Frank,
2200 N. Clark st., Chicago, Ill.
- SCHRANCK, HENRY C.,
49-55 Biddle st., Milwaukee, Wis.
- Schreiner, Albert,
Batavia, Ill.
- Schreiter, Norman Carl,
Red Lake Falls, Minn.
- Schrewis, H. B., H. S., U. S. N.,
Hosp. Steward, U. S. Navy, Naval
Hospital, Portsmouth, Va.
- SCHUELLER, FRED, WM.,
232 S. High st., Columbus, O.
- Schuh, Herman C.,
Cor. 8th & Washington, Cairo, Ill.
- Schuh, Paul G.,
607 Commercial ave., Cairo, Ill.
- Schuhl, Albert L.,
1406 N. 33d st., Omaha, Neb.
- Schultz, Anna,
2 East Main st., Tremont, Pa.
- Schultz, Chas. F. W.,
159 Chicago st., Elgin, Ill.
- Schultz, William Ludwig,
Atkinson, Neb.
- Schulz, Robert A.,
1774 Baltimore ave., Cincinnati,
Ohio.
- Schulze, Louis, Ph.G.,
2245 Eastern ave., Baltimore, Md.
- Schulze, Wilmer H., Phar.D.,
2245 Eastern ave., Baltimore, Md.
- Schumann, Henry V.,
New Braunfels, Tex.
- Schwartz, Israel,
503 E. 7th st., Brooklyn, N. Y.
- Schwartz, Maurice P.,
312-316 S. New Jersey, Indian-
apolis, Ind.
- Schwarz, Leonard J.,
837 N. Delaware st., Indianapolis,
Ind.
- Schweinfurth, Geo. E.,
866 6th ave., New York, N. Y.
- Scott, Alex W.,
115 E. Mountain ave., Ft. Col-
lins, Colo.
- Scott, Clarence A.,
Prattville, Ala.
- Scott, Edgar B.,
1733 20th st., N. W., Washington,
D. C.
- Scott, Frank Genio,
35 Bates st., Detroit, Mich.
- Scott, Harry,
824 Madison ave., New York,
N. Y.
- Scott, John Herman,
Eden Valley, Minn.
- SCOVILLE, WILBUR L.,
81 Melbourne ave., Detroit, Mich.
- Seagle, Dexter E.,
Pulaski, Va.
- Seaman, Fred A.,
406 S. Palmetto ave., Daytona
Fla.
- Sequist, Oscar Wm.,
Good Thunder, Minn.
- Searle, C. H.,
215-219 W. Ohio st., Chicago, Ill.
- Sears, Chas. B.,
109 Genesee st., Auburn, N. Y.
- Secheverell, Hugh B.,
4059 Tejon st., Denver, Colo.
- Secord, G. L., M.S., Ph.G.,
74 E. 12th st., Chicago, Ill.
- Seeley, Milton J.,
381 Passaic ave., Nutley, N. J.

- Seibert, Geo. F.,
333 Stephenson ave., Iron Mountain, Mich.
- Seidler, Alexander,
13 Ward st., Newark, N. J.
- Seidman, Harry,
S. E. Cor. Franklin and Columbia aves., Philadelphia, Pa.
- Seitz, Lorenz A.,
736 S. 4th st., St. Louis, Mo.
- Seltzer, Leonard A., Ph.C.,
Shurly Bldg., 32 Adams st., W. Detroit, Mich.
- Selzer, Eugene R., Ph.C.,
1600 E. 117th st., Cleveland, O.
- Sencindiver, Judson H.,
49 Seaton Place, N. W., Washington, D. C.
- Senecal, Henry C.,
Base Hospital No. 30, Ft. Mason, San Francisco, Cal.
- Sennewald, Emil A.,
3501 McKean ave., St. Louis, Mo.
- Serodius, Frank G.,
1511 Fern st., San Diego, Cal.
- Serrins, George,
214 Broadway, Cincinnati, Ohio.
- Seuring, Carl A.,
1501 E. 67th st., Chicago, Ill.
- Seybert, John Edward,
304 Kenmore Rd., Indianapolis, Ind.
- Seydler, Robert,
Bomarton, Tex.
- Seyfert, Paul,
Thiensville, Wis.
- Shaak, Franklin P.,
95 Elm st., Kearney, N. J.
- Shales, Marvin,
382 N. Washington st., Wilkes-Barre, Pa.
- Shannon, Thomas J.,
7 Main st., Sharon, Tenn.
- Shapiro, Joseph,
160 W. 119th st., care Licker, New York, N. Y.
- Shapiro, Leo Harold,
1735 W. Harrison st., Chicago, Ill.
- Sharkansky, Eugene Louis,
Evacuation Hospital No. 8, American E. F.
- Sharp, Solomon A.,
1845 Polk st., San Francisco, Cal.
- Sharping, A. W.,
Arlington, Minn.
- SHARPLES, STEPHEN P., S.B.,
22 Concord ave., Cambridge, Mass.
- Shattuck, H. B.,
31 E. 17th st., New York, N. Y.
- Shavel, Charles,
204 Columbia st., Brooklyn, N. Y.
- Shearer, George Keyworth,
16 N. George st., York, Pa.
- Sheblessy, Michael A.,
3459 Indiana ave., Chicago, Ill.
- Shedd, Edwin W.,
69 Boston ave., West Medford, Mass.
- Sheely, Edward Valentine,
Vance & Lauderdale, Memphis, Tenn.
- Sher, Edward,
1344 Park ave., New York, N. Y.
- Sherman, Chas. R.,
2nd floor, 19th & Farnam sts., Omaha, Neb.
- Sherrard, Chas. C.,
Box 588, Angola, Ind.
- Sherwood, Henry J.,
2064 E. 9th ave., Cleveland, O.
- Shipe, Columbus A. (Miss),
Box 196, San Marcos, Tex.
- Shippy, Earl F.,
U. S. General Hosp. No. 32, 4659 Drexel Blvd., Chicago, Ill.
- Shirley, James Norman,
Hattiesburg, Miss.
- Shnitter, Adolf, Ph.G.,
804 E. 178th st., New York, N. Y.
- SHOEMAKER, RICHARD M.,
4th & Race sts., Philadelphia, Pa.
- Shovelin, John J.,
691 E. Northampton st., Wilkes-Barre, Pa.
- Showalter, Ralph W.,
3869 N. Delaware st., Indianapolis, Ind.
- SHREVE, JOHN A.,
Main st., Port Gibson, Miss.

- SHURTLEFF, ISRAEL H.,
195 4th st., New Bedford, Mass.
- SIEGENTHALER, HARVEY N.,
25 E. Grand st., Springfield, O.
- Siegfried, Howard J.,
4676 Frankford ave., Philadelphia,
Pa.
- Sieker, Ferdinand A.,
395 Clinton ave., West Hoboken,
N. J.
- Sievers, Arthur,
Bureau of Plant Industry, Wash-
ington, D. C.
- Silkes, Charles,
85 Attorney st., New York, N. Y.
- Silverman, Abraham,
524 New Jersey ave., Brooklyn,
N. Y.
- Simon, George,
135 William st., New York, N. Y.
- Simpson, Nathan Alexander,
5529 Poplar st., Philadelphia, Pa.
- Simpson, Robert,
Race & 36th st., Philadelphia, Pa.
- Sisson, Oscar U.,
5034 Cottage Grove ave., Chi-
cago, Ill.
- Sister Mary Wilhelmina,
c. St. Mary of Nazareth Hosp.,
1120 N. Leavitt st., Chicago,
Ill.
- Sister Theresa,
St. John's Hospital, Springfield,
Ill.
- Sjurseth, Oscar B.,
Lakota, N. D.
- Skelton, Maurice B.,
4545 Michigan ave., Chicago, Ill.
- Skinner, Charles H.,
Main & State sts., Windsor, Vt.
- Skinner, Oakley Smith,
Windsor, Vt.
- Skye, Francis Josephus,
335 Exchange ave., E. St. Louis,
Ill.
- Slade, Harry A.,
10 State st., Montpelier, Vt.
- Sloss, Robert A.,
Phar. Clinton Prison, Danne-
mora, N. Y.
- Smailis, Joseph J.,
1898 Jos. Campan ave., Detroit,
Mich.
- Smetana, William S.,
916 Excelsior ave., Hopkins, Minn.
- Smith, B. Frank,
1601 Market st., Harrisburg, Pa.
- Smith, Carl E.,
5 Beekman st., New York, N. Y.
- Smith, Dennette Weymouth,
Merryville, La.
- Smith, Frank L.,
214-216 2nd ave., N., Nashville,
Tenn.
- Smith, Fred A. U., Ph.C.,
4th & Robert sts., St. Paul, Minn.
- Smith, Fred W.,
Pres. Miss. State Board of Phar-
macy, Poplarville, Miss.
- Smith, George H.,
Box 595, Fresno, Cal.
- Smith, George Waterman,
Honolulu, Territory Box 426,
Hawaii.
- Smith, Guy L.,
Guy's Drug Store, Opposite P. O.,
Douglas, Alaska.
- Smith, Henry Lees,
149 New Montgomery St., San
Francisco, Cal.
- Smith, Henry M.,
2-4 South st., Morristown, N. J.
- Smith, Herbert Alexander,
3535 College ave., Indianapolis,
Ind.
- Smith, Howard E.,
2nd & Green sts., Philadelphia, Pa.
- Smith, Howard H., Ph.G., M.D.,
845 Boylston st., Boston, Mass.
- Smith, J. Hungerford,
410 N. Goodman st., Rochester,
N. Y.
- Smith, Lauriston Stephen, Ph.G.,
Ocean ave., Cor. Pacific, Long
Beach, Cal.
- Smith, Linville H.,
701 Center st., Jamaica Plain, Mass.
- Smith, Louis Clarence,
2801 Soniat St., New Orleans, La.

- SMITH, ORIS W.,
503 South Engineer st., Sedalia,
Mo.
- Smith, Paul W.,
4836 Delmar Blvd., St. Louis, Mo.
- Smith, Theo.,
1343 Pennsylvania ave., Balti-
more, Md.
- Smith, Walter V.,
2nd & Green sts., Philadelphia, Pa.
- Smith, William M.,
Trevorton, Pa.
- Smyser, Bert Alexander,
1400 Pa. ave., S. E., Washington,
D. C.
- Snell, Tom J.,
Paris, Texas.
- SNITEMAN, CHAS. C.,
Neillsville, Clark Co., Wis.
- Snodgrass, Latta K.,
120 Main st., Little Rock, Ark.
- SNOW, CHAS. W.,
214 Warren st., Syracuse, N. Y.
- Snow, Clyde M., Ph.G., M.A.,
701 South Wood st., Chicago, Ill.
- Snyder, Ambrose C.,*
282 St. James Place, Brooklyn,
N. Y.
- Snyder, Forest Omo,
7151 Parnell ave., Chicago, Ill.
- Snyder, George T.,
879 Mack ave., Detroit, Mich.
- Snyder, Harold Berlin,
20 Goepp st., Bethlehem, Pa.
- Snyder, John Paul,
22 Hayes st., Norwich, N. Y.
- Snyder, Wm. E., Ph.G.,
6140 Michigan ave., Chicago, Ill.
- Sohrbeck, Geo. H.,
5th ave., & 16th st. Moline, Ill.
- Sohrbeck, Geo. Wm., Ph.G.,
1804 6th ave., Moline, Ill.
- Sollmann, Torald, M.D.,
1353 E. 9th st., Cleveland, O.
- Solomon, Abraham,
14 W. 115th st., New York, N. Y.
- Solomons, Isaiah A.,
29 Congress st., W. Savannah, Ga.
- Solomons, Isaiah, Jr.,
c. Solomons Co., Savannah, Ga.
- Sonnenburg, Amelia Adelaide,
1921 W. Lexington st., Balti-
more, Md.
- Soper, Geo. M.,
619 4th st., Sioux City, Ia.
- Sords, Thos. V.,
1410 W. 25th st., Cleveland, O.
- Sorowitz, Harry M.,
1703 Washington ave., New
York, N. Y.
- Soskin, Max,
439 Brooke ave., New York, N. Y.
- Southard, Frank A., Ph.G., Pub. H. S.,
S. F. Quarantine, Angel Island, Cal.
- Spargur, Roy Miles,
Twin Falls, Idaho.
- Sparhawk, Charles V.,
278 Pearl st., New York, N. Y.
- Sparks, Edgar B.,
804 Court st., Memphis, Tenn.
- Sparks, Edgar R., Ph.G.,
239 High st., Burlington, N. J.
- Sparks, James M.,
917 Garrison ave., Ft. Smith, Ark.
- Spearman, J. F.,
Anniston, Ala.
- Spease, Edw., B.Sc., Ph.C.,
1483 E. 134th st., Cleveland, O.
- Speckert, Otto Norbett,
3342 Franklin ave., St. Louis, Mo.
- Spenzér, Mary H.,
2150 Central ave., Cleveland, O.
- Spire, Wm. B., Phar.D.,
Box 67, Mt. Rainier, Md.
- Spivay, James R.,
103 S. Main st., Bluffton, Ind.
- Sprague, Wesson G.,
Main st., Flushing, Mich.
- Spring, Geo. A.,
664 6th ave., New York, N. Y.
- Staack, Hugo F.,
Maquoketa, Ia.
- Stabler, Lavid J.,
1122 W. 30th st., Los Angeles, Cal.
- Stacy, Marion F.,
14 W. Sale st., Tuscola, Ill.
- Stadelmann, Arthur W.,
1553 W. 69th st., Chicago, Ill.
- Stadelmann, Harry E.,
7042 Stony Island ave., Chicago, Ill.

- Staehle, Louis L.,
 169 South Orange ave., Newark,
 N. J.
 Staehli, Theo. H.,
 1212 Columbus ave., Boston,
 Mass.
 Staffa, August E.,
 1949 E. Commerce st., San An-
 tonio, Tex.
 Stahlhuth, Ernst,
 522 N. New Jersey St., Indian-
 apolis, Ind.
 Stamm, Dante Milton,
 Geneseo, Ill.
 St. Amour, Omer,
 Drawer, 190, Des. Monts, Quebec.
 Stanislaus, Ignatius Valerius Stanley,
 Residence Unknown.
 Starr, Frank C.,
 41 John st., New York, N. Y.
 Starr, Mabel Charlotte,
 20 Main st., S. Glen Falls, New
 York, N. Y.
 Start, Roy C.,
 2435 Warren st., Toledo, O.
 Starwalt, Ellis Jayson,
 104 Linden st., Detroit, Mich.
 Starz, Emil,
 21 W. 6th ave., Helena, Mont.
 Staudt, Albert J.,
 3520 Spring Garden st., Philadel-
 phia, Pa.
 Staudt, Louis C.,
 15 S. Broadway, Aurora, Ill.
 Stauffen, Ernst,
 41 John st., New York, N. Y.
 Stearns, Wm. L., Ph.G.,
 U. S. M. Hospital, Buffalo, N. Y.
 Stecker, Henry F.,
 4008 Van Buren st., Chicago, Ill.
 Steiger, Leonard,
 400 Lookout ave., Hackensack,
 N. J.
 Stein, Edward Theodore North,
 90 Walnut st., Montclair, N. J.
 Stein, Louis Sidney,
 City Drug Store, Wibbing, Minn.
 Stein, Milton,
 2223 N. Front st., Philadelphia, Pa.
 Stein, Samuel,
 1306 Prospect ave., New York, N. Y.
 Steinach, Edwin C.,
 776 Melrose Av., New York, N. Y.
 Steiner, Frank A.,
 107 S. Front st., Mankato, Minn.
 Steinhardt, Benjamin,
 561 Ingraham ave., Hammond, Ind.
 Stephan, Otto, P. Ph.G.,
 132 E. 22nd st., Chicago, Ill.
 Stephanson, John J., Ph.G.,
 2140 Jamaica ave., Richmond
 Hill, L. I., N. Y.
 Sterling, Chas. M., A.B.,
 920 Indiana Ave., Lawrence, Kans.
 Sterling, Montaigu M.,
 90 Beekman st., New York, N. Y.
 Sternfels, Urvan Ruiz,
 3516 Blair ave., St. Louis, Mo.
 STEVENS, ALVISO B.,
 Chem. Laboratory, Ann Arbor,
 Mich.
 Stevens, Fred S.,
 East Auburn, Cal.
 Stevens, Grant W.,
 339 Woodward ave., Detroit,
 Mich.
 Stevenson, Arthur E.,
 National Canners' Association,
 1739 H. st., N. W., Washing-
 ton, D. C.
 Stewart, Alex,
 65 Wyndham st., Guelph, On-
 tario, Can.
 Stewart, Francis E., Ph.G., M.D.,
 11 W. Phil-Ellena st., Philadel-
 phia, Pa.
 Stewart, J. A.,
 720 Jefferson ave., E., Detroit,
 Mich.
 Stewart, Russell Myers,
 Wakarusa, Ind.
 Sticht, Gustave Alfred,
 752 Flushing ave., Brooklyn, N. Y.
 Stieber, F. G. J.,
 3256 Indiana ave., Chicago, Ill.
 Stier, Carl, Ph.G.,
 U. S. Marine Hospital, Balti-
 more, Md.

- Stines, Geo. F.,
246 Main st., Connecticut, Ohio.
- Stockberger, Dr. Warner W.,
Bureau of Plant Industry, U. S.
Department of Agriculture,
Washington, D. C.
- Stockhaus, F. William,
2082 Fulton Road, Cleveland, O.
- Stocking, Charles Howard,
No. 3 Park Place, New York, N. M.
- Stofer, Richard Calvin,
28 Hayes st., Norwich, N. Y.
- Stokes, John Wesley,
224 E. North St., Indianapolis, Ind.
- Stolle, Henry J.,
4235 Magnolia ave., St. Louis, Mo.
- Stone, Clarence G., Ph.C.,
192 Front st., New York, N. Y.
- Stone, Frank Taylor,
1210 Pa. ave., N. W., Washing-
ton, D. C.
- Stookey, H. Frank, Ph.G., Ph.C.,
Princess Drug Store, Kirksville,
Mo.
- Storer, Chas. A.,
5817 Magnolia ave., Chicago, Ill.
- Stout, Marion A., Ph.G.,
Bluffton, Ind.
- Stover, Chas. A., Ph.G.,
1360 Mass. ave., Cambridge, Mass.
- Stover, Wm. Francis,
480 Shirley st., Winthrop, Mass.
- Stowe, James Pinkney,
26 S. Tryon st., Charlotte, N. C.
- Strahlmann, Edw.,
4th & D sts., San Diego, Cal.
- Strate, Herbert A.,
700 E. 5th st., St. Paul, Minn.
- Strawinski, J. Frank,
3900 Terrace st., Wissahickon,
Philadelphia, Pa.
- Strawn, May (Miss), Ph.C.,
954 N. Pennsylvania st., In-
dianapolis, Ind.
- Streeper, Frank P.,
8528 Germantown, Chestnut Hill,
Philadelphia, Pa.
- Strehlow, H. R.,
Casselton, N. D.
- Strehlow, Max Henry,
Kindred, N. D.
- Stribbling, J. H.,
Philadelphia, Miss.
- Strimling, Abraham,
94 Highland ave., Minneapolis,
Minn.
- Strimling, William
94 Highland ave., Minneapolis,
Minn.
- Stroup, Freeman P., Ph.M.,
145 N. 10th st., Philadelphia, Pa.
- Stuart, Francis J.,
3964 Wyoming st., St. Louis, Mo.
- Stuart, H. A. (Mrs.),
126 E. Lake st., Minneapolis,
Minn.
- Stuchlik, John,
3859 W. 26th st., Chicago, Ill.
- Stucky, Edw. W., Ph.B., A.M.,
161 N. Illinois st., Indianapolis,
Ind.
- Sturgeon, Walter J.,
305 Market st., Kittanning, Pa.
- Sturmer, Julius Wm., Ph.G., Phar.D.,
601 Lees ave., Collingswood, N. J.
- Stutzlen, Frank C.,
10 Park ave., Elizabeth, N. J.
- Subin, Israel,
1800 N. 7th st., Philadelphia, Pa.
- Sudro, William F.,
1117 13th st., N. Fargo, N. Dak.
- Suhr, Louise Seline,
589 Spring st., West Hoboken,
N. J.
- Sullivan, John P.,
401 N. Carey st., Baltimore, Md.
- Sultan, Fred Wm.,
6151 Kingsbury Blvd., St. Louis,
Mo.
- Sumner, Jennie H. (Miss), Ph.G.,
1858 Centre st., W. Roxbury,
Mass.
- Suppan, Leo R. A.,
2109a Russell ave., St. Louis, Mo.
- Susslin, Charles A.,
2654 Valentine ave., New York,
N. Y.
- Suter, Arthur Lee,
1295 Bardstown Rd., Louisville, Ky.

- Sutter, Joseph R.,
307 N. 3rd st., Burlington, Ia.
- Sutton, James Linwood,
Albemarle, N. C.
- Swain, Robert L.,
Sykesville, Md.
- Swainbank, H. H.,
82 S. Main st., Wilkes-Barre, Pa.
- Swan, John Nesbitt,
University P. O., Miss.
- Swann, Edwin Garner,
Pharmacist, U. S. Navy Dispensary,
Navy Yard, Philadelphia, Pa.
- Swanson, Edward Edwin,
Y. M. C. A., Indianapolis, Ind.
- Swanson, Joseph Allen,
5259 N. Clark st., Chicago, Ill.
- Swaringen, Dewitt C.,
Pharmacist, China Grove, N. C.
- Swartz, Geo. F.,
Mobridge, S. D.
- Sweeney, A. J.,
Salem, Ill.
- SWEET, CALDWELL,
26 Main st., Bangor, Me.
- Sweet, Wm. H.,
1731 Chicago ave., Minneapolis, Minn.
- Swingle, Leroy Dey,
University of Utah, Salt Lake City, Utah.
- Switzer, Luin Burt,
Southport, Conn.
- Swoboba, Adolph,
901-903 14th st., Denver, Colo.
- Sylvander, Nels J.,
423 W. 3rd st., Red Wing, Minn.
- Tabenski, Longin, Ph.G., M.D.,
1725 W. 18th st., Chicago, Ill.
- Taber, Joseph M.,
c. Wilson Drug Co., Reno, Nev.
- Tailby, J. Allen,
368 Congress st., Boston, Mass.
- Takamine, Jokichi,
Clifton, N. J.
- Tamayo, Silverio A.,
Gral Gracia y Cruz (Farmacia),
Bayamo, Oriente, Rep. of Cuba.
- Tanke, Clayton E.,
2310 Broadway, Indianapolis, Ind.
- Tansey, Owen Hilary,
276 Clifton ave., Montreal, Can.
- Taplin, Clifford Florian,
Milroy, Minn.
- Taquechel, Francisco, M.D.,
Box 103, Obispo 27, Havana, Cuba.
- Tarkenton, Edw. L.,
Nash st., Wilson, N. C.
- Taylor, Edgar D.,
1305 Main st., Richmond, Va.
- Taylor, Francis O., Ph.C.,
54 Philadelphia, E., Detroit, Mich.
- Taylor, Irvan E.,
709 E. 62nd st., Broad Ripple,
Indianapolis, Ind.
- Taylor, Leon A.,
100 Clifton ave., Lakewood, N. J.
- Taylor, M. M.,
602 Franklin st., Tampa, Fla.
- Taylor, Thomas R.,
Park & Brambleton aves., Norfolk, Va.
- Taylor, Wm.,
2355 Valentine ave., Bronx, New York, N. Y.
- Teeters, Wilber J.,
Iowa Coll. of Pharm., Iowa City, Ia.
- Tehner, Guy Oram,
279 Greene ave., Brooklyn, N. Y.
- Terry, Robert Wood,
Groveport, O.
- Tesche, Hjalmar Gustaf Anderson,
Soedertelje, Sweden.
- Thatcher, Edmund Sheldon,
334 Ogden ave., Milwaukee, Wis.
- Thelan, Karl M.,
Shelby, Neb.
- Thiesing, Edw. H.,
Gilbert & Lincoln aves., Cincinnati, O.
- Thomas, Joe Parks,
1916 W. Chestnut st., Altoona, Pa.
- Thomas, John B.,
Balto. & Light sts., Baltimore, Md.

- Thomas, Robert, Jr.,
 108 S. Broad st., Thomasville, Ga.
 Thomas, Tony B.,
 1323 E. 24th st., San Leandro, Cal.
 Thomason, Wm. P.,
 Guntersville, Ala.
 Thome, Edgar Reynolds,
 406 Wildwood ave., Jackson,
 Mich.
 Thompson, Charles Henry,
 A. E. C. Hospital, Anchorage,
 Alaska.
 Thompson, Clifford P.,
 503 Main st., Springfield, Mass.
 Thompson, Edwin T.,
 911 W. 7th st., Sioux City, Ia.
 Thompson, Frank A., Ph.C.,
 502 Trombley ave., Detroit, Mich.
 Thompson, G. E.,
 Chatham, Va.
 Thompson, Harry Landis,
 2931 You st., Lincoln, Neb.
 Thompson, John R.,
 641 Summerlea st., Pittsburgh, Pa.
 Thompson, Leon A., Phar.D.,
 809 Beacon st., Boston, Mass.
 Thorburn, Albert D.,
 316 E. 33rd st., Indianapolis, Ind.
 THORN, HENRY P., Ph.G.,
 5 S. Main st., Medford, N. J.
 Thornhill, Sewell,
 Sayville, N. Y.
 Thum, George Ernest,
 61 3rd st., Elizabeth, N. J.
 Thum, John K., Ph.G.,
 Lankenaw Hosp., Corinthian &
 Girard aves., Philadelphia, Pa.
 THURSTON, AZOR,
 2018 North High st., Columbus, O.
 Thurston, Emory W.,
 4144 Carrollton ave., Indianapo-
 lis, Ind.
 Tibbetts, William Harris,
 Pearl & Cecunbia st., Union City,
 Ind.
 Tilton, Claude E.,
 Fairmount, Ill.
 Timmerman, Richard H.,
 802 Lexington ave., New York,
 N. Y.
 Tindall, Henry Clay,
 217 E. Broadway, Excelsior
 Springs, Mo.
 Tobias, Morris,
 56 Ave. B, New York, N. Y.
 Tobin, John J.,
 243 Dorchester st., S., Boston,
 Mass.
 Tocco, Orazio,
 147 W. 10th st., New York, N. Y.
 Todd, Albert May,
 323 N. Rose st., Kalamazoo, Mich.
 Toller, Adolph J.,
 417 W. Third st., Sioux City, Ia.
 Tompkins, George R.,
 Hudson & Vestry sts., New York,
 N. Y.
 Toomer, S. L.,
 Auburn, Ala.
 Topf, Jacob A.,
 2000 Larrabee st., Chicago, Ill.
 Topping, Arthur E., Ph.G.,
 Overbrook, Kans.
 Topping, Geo. B., Ph.C.,
 61 Parsons ave., Columbus, O.
 Townsend, Rupert Richard,
 Glenwood, Pike Co., Ark.
 Trantham, Isham A.,
 876 N. Main st., Springfield, Mo.
 TrevasKis, William John,
 Lock Drawer No. 482, Paragould,
 Ark.
 Trienens, Joseph,
 819 Buena ave., Chicago, Ill.
 Troxler, Robert Fulton,
 U. S. Marine Hospital, San Fran-
 cisco, Cal.
 Truby, Miriam Grace (Miss),
 502 Kelly st., Wilkinsburg, Pa.
 Truedson, Eric P.,
 122-124 S. Meridian st., Puyallup,
 Wash.
 Tuck, Henry C.,
 10 W. Market st., Wilkes-Barre, Pa.
 Tucker, Thomas H.,
 28-30 Fulton st., New York, N. Y.
 Tufts, Archie L.,
 1359 St. Nicholas ave., New
 York, N. Y.

- Turner, Del Delos,
c. Coll. of Pharm., U. of Minn.,
Minneapolis, Minn.
- Turner, Joseph L.,
1398 Metropolitan ave., Brook-
lyn, N. Y.
- Turner, Thomas David,
Henning, Tenn.
- Tuthill, Fred P., Ph.G., Phar.D.,
1457 Union st., Brooklyn, N. Y.
- Tuttle, Geo. O.,
387 Congress st., Portland, Me.
- Twombly, A. P.,
Box 94, N. Rochester, N. H.
- Tyler, Earl Albert,
244 Murray st., Elizabeth, N. J.
- UHLICH, FERDINAND G.,
2001 Salisburg st., St. Louis, Mo.
- Ulen, Hamilton C.,
224 Jackson st., Toledo, O.
- Umenhofer, Adolph,
2405 N. Halsted st., Chicago, Ill.
- Ungerer, Wm. Geo.,
124 W. 19th st., New York, N. Y.
- Urban, Leopold C.,
529 Market st., Milwaukee, Wis.
- Urbish, A. J.,
Oak Lawn & Dickson, Dallas, Tex.
- Utech, P. Henry, Ph.G.,
209 Chestnut st., Meadville, Pa.
- Utt, Alfred Reuben,
Glen Ellyn, Ill.
- Utterback, Earl,
532 S. Van Buren st., Iowa City, Ia.
- Vaccarino, Joseph Anthony,
295 Elizabeth st., New York, N. Y.
- Vahlteich, Hans Walter,
2000 N. Halsted st., Chicago, Ill.
- Valentine, Chas. Philip,
Residence Unknown.
- Van Aller, Thos. S.,
210 S. Broad st., Mobile, Ala.
- Van Antwerp, James C.,
250 State st., Mobile, Ala.
- Van Derveer, Robert H.,
Broad & Monmouth sts., Red
Bank, N. J.
- Van Liew, Wm. K.,
Akron, Colo.
- Van Schaack, Cornelius P.,
116 W. Lake st., Chicago, Ill.
- Van Vleet, M.,
506 Gratiot ave., Detroit, Mich.
- Vance, Winfield S.,
5th & Broad sts., Gadsden, Ala.
- Vanderkleed, Chas. E.,
200 Harvard ave., Collingswood,
N. J.
- Vane, Patrick P.,
309 B st., S. E., Washington, D. C.
- Vargas, Heredis Jorge,
19 Shailer st., Brookline, Mass.
- Varney, Edw. F.,
1580 Madison st., Oakland, Cal.
- Varnum, Walter H.,
801 Massachusetts st., Lawrence,
Kans.
- Vaupell, Geo. F., Ph.C.,
758 S. Western ave., Chicago, Ill.
- Vazquez, Carlos R., M.D.,
13 Calixto Garcia, P. O. Box 40,
Manzanillo, Cuba.
- Veillon, Louis, M.D.,
1800 S. Second st., Monsanto
Chemical Works, St. Louis, Mo.
- Vellema, Peter,
5 Leonard st., N. W., Grand
Rapids, Mich.
- Velsor, Joseph H.,
9 Gold st., New York, N. Y.
- Verneau, Edward J.,
147 Irving st., Rahway, N. J.
- Vernor, James,
33 Woodward ave., Detroit, Mich.
- Vestal, John Wilfred,
402 E. Raymond st., Indianapolis,
Ind.
- Veve, Miguel A.,
Box 96, Fajardo, Porto Rico.
- Vidal, Carlos, Phar.D.,
P. O. Box 416, Cruces, Cuba.
- Viehover, Arno, M.D.,
Department of Chemistry, Ur-
bana, Ill.
- Vilas, Fred L.,
Pierre, S. D.
- Villamena, Diadato,
2237 1st ave., New York, N. Y.

- Vodheim, Joseph,
Tyler, Minn.
- Voigt, Joseph F.,
12th & Chestnut sts., Chattanooga, Tenn.
- VOISS, ARCADIVS,
4700 Kenwood ave., Chicago, Ill.
- Vold, John H.,
26 S. 3rd st., Grand Forks, N. D.
- Von Hermann, Eugene,
122 S. Michigan ave., Chicago, Ill.
- Vorsanger, Lillian,
2354 Milwaukee ave., Chicago, Ill.
- Voss, Edw., Jr.,
1201 Vine st., Cincinnati, O.
- Votteler, Wm.,
Shelby & Oak sts., Louisville, Ky.
- Vowell, Louis S.,
62 S. Main st., Washington, Pa.
- Wagener, Leonard R.,
905 S. State st., Ann Arbor, Mich.
- Wagner, Arthur C.,
11 Pierce ave., Everett, Mass.
- Wagner, Louis,
Mountain View, Cal.
- Wakeman, Nellie A.,
356 Chemistry Bldg., Madison, Wis.
- WALBRACH, ARTHUR,
1200 15th st., Denver, Colo.
- Walbridge, Cyrus P.,
N. E. Cor. 4th & Market sts.,
St. Louis, Mo.
- Walker, Alfred,
Sutton, W. Va.
- Walker, Charles F.,
c. Medical Coll. of Va., Richmond, Va.
- Walker, Charles Robert,
Ensley, Ala.
- Walker, Robert H., B.S., Ph.M.,
Gonzales, Tex.
- Wall, C. LeRoy,
5829 Montrose st., Philadelphia, Pa.
- Wall, Otto A.,
4108 W. Pine st., St. Louis, Mo.
- Wallace, George R.,
426 Fairmount ave., Philadelphia, Pa.
- Wallace, John C., Ph.D.,
113 E. Washington st., New Castle, Pa.
- Walleck, Andrew E.,
8341 Woodland ave., Cleveland, O.
- Walpole, Robert E.,
Springfield, S. D.
- Walsdorf, Edw. H.,
900 Peters ave., New Orleans, La.
- Walter, Adeline,
Sheridan, Mont.
- Walter, Herman,
213 Second ave., New York, N. Y.
- Walter, Peter G., Ph.G., Ph.D.,
Chestnut & Lockhart sts., Pittsburgh, Pa.
- Waltermann, Henry B.,
5th & Lock sts., Cincinnati, O.
- Walters, W. J.,
108 Dana st., Wilkes-Barre, Pa.
- Walton, Lucius L., Ph.G., Ph.M.,
Ph.D.,
N. E. Cor. 4th & Pine sts., Williamsport, Pa.
- Walz, Jacob L.,
2128 Mt. Holly st., Wallbrook, Baltimore, Md.
- Wardle, Arthur S.,
1-3 Warren st., Hudson, N. Y.
- Warn, Wm. E.,
50 First st., Keyport, N. J.
- Warner, Carl A.,
5210 Broadway, Chicago, Ill.
- Warner, Cortice M.,
4357 N. Penn st., Indianapolis, Ind.
- Warner, William James,
1407 Arch st., Berkeley, Cal.
- Warren, Lewis E.,
113 W. 18th st., New York, N. Y.
- Washburn, Crosby B.,
32 Adams ave., W., Detroit, Mich.
- Wasserscheid, August A.,
30 & 32 Platt st., New York, N. Y.
- Watkins, Chas. Wm.,
227 Illinois st., Indianapolis, Ind.
- Watson, George N.,
1009 Maine st., Lawrence, Kans.
- WATSON, HERBERT K.,
803 Market st., Wilmington, Del.

- Watson, Joseph R., Ph.C.,
 330 18th ave., N., Seattle, Wash.
 Watson, Robert Gordon,
 1103 Cook st., Denver, Colo.
 Watson, Wm., Jr.,
 1117 Howard ave., Utica, N. Y.
 Watters, Alex. J.,
 Cor. Fifth & Wall sts., Los Angeles, Cal.
 Watters, Henry,
 138 Rideau st., Ottawa, Can.
 Watts, Thomas McCoy,
 Holstein, Ia.
 WAUGH, GEO. J.,
 Ontario st., Stratford, Ontario, Can.
 Wear, John,
 3648 Chestnut st., Philadelphia, Pa.
 Weaver, Clarence A.,
 941 Trumbull ave., Detroit, Mich.
 Webb, Edw. N.,
 2120 Iuka ave., Columbus, O.
 Webber, Daisy B. (Mrs.),
 2450 Wylie ave., Pittsburgh, Pa.
 Weber, Don C.,
 Arlington, Neb.
 Webster, John H., Ph.G.,
 866 Jefferson st., Detroit, Mich.
 Webster, Richard C.,
 26 N. Main st., Canton, Ill.
 Weeks, Carl,
 Des Moines, Ia.
 Weeks, John A.,
 706 Hutchins ave., Ballinger, Tex.
 Weicker, Theo.,
 Prospect Manor, Stamford, Conn.
 WEIDEMANN, CHAS. A., PhG., M.D.,
 2148 Green st., Philadelphia, Pa.
 Weil, Jacob,
 269 Canal st., New York, N. Y.
 Weimer, Roth Eardon,
 413 Charles st., Mt. Oliver, Pittsburgh, Pa.
 Weinkauff, Jacob,
 600 Fifth ave., Peoria, Ill.
 Weinstock, Sidney,
 879 Freeman st., Bronx, New York, N. Y.
 Weise, Carl E.,
 2704 West End ave., Nashville, Tenn.
 Weiser, Wm. P.,
 501 Market st., Camden, N. J.
 Weisner, Nicholas F.,
 20th & Parrish sts., Philadelphia, Pa.
 Weiss, Emil O.,
 794 6th ave., New York, N. Y.
 Welfare, Sam E.,
 Winston-Salem, N. C.
 WELLCOME, HENRY S.,
 Snow Hill Bldg., London, Eng.
 Weller, Franklin P.,
 755 8th st., S. E., Washington, D. C.
 Wells, James H., LL.B., Ph.G.,
 Fifth ave. & Jackson st., Chicago, Ill.
 Welsch, Henry,
 2701 Peniston st., New Orleans, La.
 Welsh, Joseph B.,
 2704 Arkansas ave., St. Louis, Mo.
 Wendt, Wm. C.,
 47 S. High st., Columbus, O.
 Wentland, William Henry,
 Drawer N. 248, Manor, Tex.
 Werchshagen, Otto,
 258 W. Biddle st., Baltimore, Md.
 Werner, Louis,
 914 Race st., Cincinnati, O.
 Werner, Wm. F.,
 2202 E. 10th st., Indianapolis, Ind.
 Wesner, Henry C.,
 Box 388, Windsor, Mo.
 West, Charles A.,
 14 Fulton st., Boston, Mass.
 Westbrook, Chas. G.,
 Lock Box 134, Newbern, Tenn.
 Westcott, James W., Ph.G.,
 Charles & Franklin sts., Baltimore, Md.
 Westenfelder, Chas. W.,
 37 E. Main st., Springfield, O.
 Westheimer, David,
 322 Central ave., Brooklyn, N. Y.

- Westmoreland, Edwin R., Ph.G.,
Lockhart, Tex.
- Wetterstroem, Caroline (Mrs.),
2844 Colerain ave., Cincinnati, O.
- Wetterstroem, Theo. D., Ph.G.,
118 E. 6th ave., Cincinnati, O.
- Weygandt, William H.,
170 S. 9th st., Brooklyn, N. Y.
- Wheatcroft, John C.,
Grayville, Ill.
- Wheeler, Albert A., Phar.D.,
1795 W. Grand Blvd., Detroit, Mich.
- Wheeler, Carlton B.,
18 Main st., Hudson, Mass.
- WHELPLEY, HENRY M., Ph.G., M.D.,
2342 Albion Place, St. Louis, Mo.
- Whidden, Ray Allen,
161 N. Franklin st., Chicago, Ill.
- Whipple, Oscar Kellogg,
Broad & Fayette sts., Bridgeton,
N. J.
- White, Edw. R.,
Main st., Salisbury, Md.
- White, Harry A.,
Wyoming, Ill.
- White, Jennie Maguire,
416 Hayes st., San Francisco, Cal.
- White, Joseph L.,
149 New Montgomery st., San
Francisco, Cal.
- White, Pinkney McGill,
1232 W. Lafayette ave., Balti-
more, Md.
- White, Robert C.,
23 N. 7th st., Philadelphia, Pa.
- White, W. D.,
12 Laning Bldg., Wilkes-Barre, Pa.
- White, Walter H.,
39 S. Palifox st., Pensacola, Fla.
- White, Wm. R., Ph.C.,
311 Grace st., Nashville, Tenn.
- Whitehouse, Harry,
Johnson City, Tenn.
- Whitlock, William Thomas,
423 Riverside ave., Spokane, Wash.
- Whitmore, Geo. C.,
c. Scholtz Drug Co., Denver, Colo.
- Whitney, David V., Ph.G.,
714 Wyandotte st., Kansas City,
Mo.
- Whitney, Minnie M. (Mrs.),
714 Wyandotte st., Kansas City,
Mo.
- Whitney, Robert Buckingham,
34 So. 17th St., Philadelphia, Pa.
- Whittington, Omar Harwell,
Waldron, Ark.
- Whittlesey, Henry H.,
East Side Pharmacist, Pocatello,
Idaho.
- Whorton, Carl,
5th & Chestnut sts., Gadsden, Ala.
- Wich, Henry E.,
1230 N. Stricker, st. Baltimore, Md.
- Wickham, Edward A.,
482 Broad st., Newark, N. J.
- WICKHAM, WM. H.,
270 Park ave., New York, N. Y.
- Widrig, T. J.,
6th & Washington ave., Newport,
Ky.
- Wierks, Clarence,
c. Schlagels Pharmacy, Daven-
port, Ia.
- Wierzbicki, Stephen,
U. S. Naval Hospital, 263 Flush-
ing Ave., Brooklyn, N. Y.
- Wiggin, Harry C.,
14 Fulton st., Boston, Mass.
- Wilcox, Levi, Ph.B.,
145 Woodlawn Ter., Waterbury,
Conn.
- Wilder, Gaston H.,
510 23rd st., Galveston, Texas.
- Wildman, Ernest Atkins,
2923 Wash. Blvd., Indianapolis,
Ind.
- Wiles, Wood,
104 W. Walnut st., Bloomington,
Ind.
- Wiley, Harvey W.,
Cosmos Club, Washington, D. C.
- Wilhelm, Werner F.,
244 W. 73rd st., Chicago, Ill.
- Wilke, Lester W.,
Garnareello, Iowa.
- Wilkerson, Jerome A.,
c. Missouri Athletic Association,
4th & Washington sts., St.
Louis, Mo.

- Williams, Edward,
Gay Bldg., Madison, Wis.
- Williams, John Lewis,
Doctor of Optics, P. O. Box 718,
Three Rivers, Province Quebec.
- Williams, John M.,
115 W. 68th st., New York, N. Y.
- Williams, Lawrence S.,
1300 N. Caroline st., Baltimore,
Md.
- Williams, N. Emery, Ph.G.,
508 N. Grand ave., St. Louis, Mo.
- WILLIAMS, SEWARD W., Ph.C., F.C.S.,
5431 Cornell ave., Chicago, Ill.
- Williamson, Harry Hays, H. S.,
U. S. N., U. S. S. Susquehanna,
c. Postmaster, New York, N. Y.
- Williamson, Thomas M.,
40 N. Market st., Frederick, Md.
- Willman, Wm. G.,
Adams st., Brownsville, Tex.
- WILSON, BENJ. O.,
19 Morse st., Newton, Mass.
- Wilson, Chas. F.,
c. Pitman & Wilson, Rushville, Ind.
- Wilson, Eugene C.,
c. Medical College of Virginia,
Richmond, Va.
- Wilson, Lincoln,
3973 Tennyson st., Denver, Colo.
- Wilson, Robert C.,
University of Georgia, Athens, Ga.
- Wimmer, Curt Paul,
115 W. 68th st., New York, N. Y.
- Windolph, J. Fred,
Hayes st., Norwich, N. Y.
- WINKELMANN, JOHN H.,
118 W. Lombard st., Baltimore,
Md.
- Winn, Howard Atkins, Ph.G.,
57 Somerset ave., Winthrop, Mass.
- Winski, Frank B.,
34 Woodland Pl., Stamford, Conn.
- Winter, James H.,
1375 Valencia st., San Francisco,
Cal.
- Winter, William Patrick,
2801 West End ave., Nashville,
Tenn.
- Winters, Arthur James,
Elk Rapids, Mich.
- Wirth, Adam, Ph.M.,
5902 Hurst, Cor. Elenore st., New
Orleans, La.
- Wirth, Rudolph,
158 West 99th st., New York, N. Y.
- Wirthman, John G.,
31st & Troost ave., Kansas City,
Mo.
- Wirthman, Joseph C.,
31st & Troost ave., Kansas City,
Mo.
- Wisner, Ebert H.,
508 Washington st., N., Valparaiso,
Ind.
- Witt, Charles T. A.,
548 Columbus ave., Boston, Mass.
- Witting, Fred F., Ph. G.,
Residence Unknown.
- Wittkamp, Clarence T.,
P. O. Box No. 10, Clemont County,
Mulberry, Ohio.
- Wittmer, Robert S. R.,
208 W. Carson st., Pittsburgh, Pa.
- Woehner, Fred A.,
c. Great Falls Drug Co., Great
Falls, Mont.
- Woehner, Walter Albert,
117 Fourth st., San Francisco, Cal.
- Wolf, Chas. A.,
401 S. Broadway, Baltimore, Md.
- Wolf, J. Carlton, Phar.D.,
401 S. Broadway, Baltimore, Md.
- Wolfe, Joseph Albert,
40th & Penn ave., U. S. Marine
Hosp., Pittsburgh, Pa.
- Wolff, D. O.,
278 Dartmouth st., Boston, Mass.
- Wolff, Edw. H.,
522 Washington ave., St. Louis,
Mo.
- Wood, Carroll E.,
201 9th ave., S. W., Roanoke, Va.
- Wood, Frank Davidson,
505 Beechurt ave., Morgantown,
W. Va.
- Wood, George W.,
6642 Michigan ave., Chicago, Ill.

- Wood, Horatio C., Jr., M.D.,
1905 Chestnut st., Philadelphia,
Pa.
- Wood, James P.,
2 Church st., New Haven, Conn.
- Woods, Samuel R.,
110 S. Main st., Lamar, Col.
- Woodworth, D. Olin,
122 W. 1st st., Albany, Ore.
- Wooten, Thos. V.,
43-93 Leon st., Boston, Mass.
- Wooyenaka, Keizo,
1021 Higashi-Nakano, Nakano,
Toyotamagum, Tokio, Japan.
- Worth, Thos. R.,
109 N. Main st., Sebastopol, Cal.
- Worthington, John W. W.,
Pen Argyll, Pa.
- Wrench, Henry E., Jr., Ph.G.,
610 Bloomfield ave., Montclair,
N. J.
- Wright, Eugene Ware,
609 Jackson ave., Memphis, Tenn.
- Wright, John Shepard,
3718 North Pennsylvania st., In-
dianapolis, Ind.
- Wuensch, Henry Oscar,
515 Washington st., East Liver-
pool, O.
- Wulling, Fred J.,
Minnesota University, Minneapo-
lis, Minn.
- Wunderlich, Edw.,
1532 Dryades st., New Orleans, Pa.
- Wurdach, John H.,
15 Grape st., Mount Olive, P. O.,
Pittsburgh, Pa.
- Wyckoff, Elmer E.,
246 E. 5th st., Brooklyn, N. Y.
- Wyszynski, Walter H.,
8737 Commercial ave., South
Chicago, Ill.
- Yardumian, Haig Bedros,
Residence Unknown.
- Yates, Franklin B.,
155 Leonard st., New York, N. Y.
- Yeager, Emery James,
1214 Heath st., Lafayette, Ind.
- Yeargan, Reagan Lawrence,
Acme Drug Co., Harriman, Tenn.
- Yongue, James Douglas,
Pickens, S. C.
- Young, Andrew Palmerston,
153 Grand River ave., Detroit,
Mich.
- Young, Clarence C.,
735 Church st., Nashville, Tenn.
- Young, Fred H.,
1759 Ainslie st., Chicago, Ill.
- Young, Geo. O.,
Buckhannon, W. Va.
- Youngken, Heber W., Ph.G., A.B.,
A.M.,
456 Winona ave., Germantown,
Pa.
- Zacovic, Andrew,
46 Collins ave., Uniontown, Pa.
- Zagat, Mendel,
Prospect ave. & 156th st., Bronx,
New York, N. Y.
- Zamora, Manuel,
913-915 R. Hidalgo, Manilla, P.
I.
- Zeamer, Harry W.,
240 Locust st., Columbia, Pa.
- Zeluff, Irvin Simpson,
Farmers ave., Hollis, Long Island,
N. Y.
- Zembsch, Lawrence,
Medical Corps U. S. Navy Hosp.
Corps Training School, Naval
Training Station, Naval Op-
erating Base, Hampton Roads,
Va.
- Zickes, Elmer Joseph.,
4521 Clark ave., S. W., Cleveland,
O.
- Ziefle, Adolph,
Oregon Agriculture College, Cor-
vallis, Ore.
- Ziegler, Howard P.,
201 Windsor st., Reading, Pa.
- Ziegler, Washington Hayne,
c. Medical Coll. of S. C., 213
Rutledge ave., Charleston, S. C.
- Zielinski, Max A.,
4071 E. 59th st., Cleveland, Ohio.
- Zieske, Arthur, Ph.G.,
214 1st ave., S. W., Watertown,
S. D.

- | | |
|---|--|
| Zimmerman, Theophilus,
Rose Free Dispensary, 7th &
Cherry sts., Terre Haute, Ind. | Zottman, Wm. H.,
1 Church st., Burlington, Vt. |
| Zink, Edward,
203 Fulton st., New York, N. Y. | Zuck, F. J.,
Kirkland, Ill. |
| Zinn, Charles E.,
2600 E. 31st st., Kansas City,
Mo. | Zuenkeler, J. Ferd., Ph.G.,
2350 Highland ave., Cincinnati,
O. |
| ZOELLER, EDW. V.,
Main st., Tarboro, N. C. | Zufall, C. J.,
641 Washington, St., New York,
N. Y. |
| Zoeller, Geo.,
1557 W. Chicago ave., Chicago, Ill. | Zutz, Henry Emil,
673 N. Dale st., St. Paul, Minn. |
| Zonies, Nathan,
29th & Diamond st., Philadelphia,
Pa. | Zwick, Mary Hall (Mrs.),
511 S. Humphrey ave., Oak Park,
Ill. |

GEOGRAPHICAL ROLL OF MEMBERS.

HONORARY MEMBERS.

FOREIGN COUNTRIES.

ENGLAND.

- E. M. Holmes, F.L.S., *London*, 1899.
Henry George Greenish, *London*, 1913.
David Hooper, F.I.C., F.C.S., *Wesion*, 1899.

GERMANY.

- Dr. Arthur Meyer, *Marburg*, 1910. Dr. Ernst Schmidt, Geh. Regierungsrath,
Dr. Herman Schelenz, *Cassel*, 1912. *Marburg*, 1899.

SWITZERLAND.

- Dr. Heinrich Zoernig, *Basel*, 1916.
Dr. Alexander Tschirch, *Berne*, 1910.

ACTIVE MEMBERS.

(List corrected to April 24, 1919.)

Members are requested to report any inaccuracies in these lists, and to notify the General Secretary and Treasurer of all changes of address.

(The names of Life Members in Capitals. Names of Life Members under the old Constitution in *italics*.)

UNITED STATES OF AMERICA.

ALABAMA—ALASKA—ARKANSAS.

ALABAMA.

Anniston.

Spearman, J. F. 1918

Auburn.

Blake, Lynn Stanford. 1914

Toomer, S. L. 1918

Birmingham.

Adams, William Jackson. 1918

Hughes, James Lewis. 1918

Camp Sheridan.

Lundgren, Sgt. Rudolf. 1913

Ensley.

Cale, E. E. 1918

Walker, Charles Robert. 1918

Gadsden.

McDiarmid, Daniel Palmer. 1909

Vance, Winfield Scott. 1909

Whorton, Carl. 1908

Guntersville.

Thomason, William Pearce. 1910

Lineville.

Hubbard, Newman Grady. 1918

Mobile.

Demony, Marshall J. 1915

Eichold, Bernard Herbert. 1905

Van Aller, Thomas S. 1907

Van Antwerp, James Callanan. 1905

Phoenix City.

Morgan, David Elias, Dr. 1918

Prattville.

Scott, Clarence Alexander. 1905

Tuscaloosa.

Bingham, William Ellison, A.B.,

Univ. of Miss. 1909

Tuskegee.

Lewis, Lawrence Campbell. 1910

ALASKA.

Anchorage.

Loussac, Zachary Joshua. 1916

Thompson, Charles Henry. 1919

Douglas.

Smith, Guy Livingstone. 1909

Juneau.

Britt, William E. 1916

ARKANSAS.

Atkins.

Hogan, Walter C. 1918

Camden.

MORGAN, AYLMER LEE. 1890

Camp Pike.

Ewing, Edgar F. 1918

Fort Smith.

Sparks, James Mitchell. 1894

Glenwood, Pike Co.

Townsend, Rupert Richard. 1919

Helena.

Draper, Thomas J. 1914

Hot Springs.

Eisele, Martin Augustine. 1907

Lehman, Charles Walter, A.B. 1907

Jasper.

Arbaugh, Rufus C., Ph.G. 1912

Little Rock.

McClerkin, Felix Wm. 1918

Schachleiter, Frank. 1917

Snodgrass, Latta Kavanaugh. 1901

Paragould.

Trevaskis, Wm. J. 1918

Piggott.

Potter, Maynard H., Ph.G.,

Ph.C. 1906

ARKANSAS—CALIFORNIA.

<i>Van Buren.</i>			Philip, Waldemar Bruce, Ph.G.,	
Whittington, Omar Harwell.....	1915		Phar.D.....	1907
<i>Warren.</i>			Varney, Edward Francis.....	1892
Appleton, William Riley.....	1901		<i>Orland, Glenn Co.</i>	
Davis, A. T.....	1914		Birch, Mary Cushman (Mrs.)...	1909
CALIFORNIA.			<i>Pasadena.</i>	
<i>Angel Island.</i>			JAMIESON, THOMAS NEVIN.....	1903
Southward, Frank A., Ph.G.....	1903		Leavitt, Adoniram Judson.....	1905
<i>Auburn.</i>			<i>Patton.</i>	
Stevens, Frederick Solon.....	1903		Dyna, Carl Frederik Julius,	
<i>Bakersfield.</i>			Ph.G.....	1909
Baer, Edward Arthur.....	1907		<i>Riverside.</i>	
Hughes, James A.....	1909		Porter, G. Ellis, A.B.....	1909
<i>Berkeley.</i>			<i>Sacramento.</i>	
Lea, E. J.....	1918		Kirk, H. S.....	1913
Mueller, Fred.....	1915		<i>San Diego.</i>	
Schmidts, Carl L.....	1917		Kennedy, John Hoskins.....	1919
Warner, William James.....	1913		Strahlmann, Edward.....	1909
<i>Corona.</i>			<i>San Francisco.</i>	
Schaak, Milton Franklin.....	1906		Carey, Henry B.....	1909
<i>Eureka.</i>			Eaton, Elgar Otis.....	1915
Bohmansson, Robert Hugo.....	1901		Fletcher, David M.....	1904
<i>Fortuna.</i>			Flint, John Henry.....	1909
Bowman, Reginald Hamilton... ..	1909		Gibson, Frank L.....	1904
<i>Fresno.</i>			Green, Franklin Theodore.....	1908
Lich, Robert.....	1917		Headen, Claude Thomas, Ph.C..	1909
Smith, Geo. Henry.....	1909		Jorgenson, Arthur Lawrence	
<i>Glendora.</i>			Theodore.....	1916
DAWSON, JOHN HENRY, PH.G... ..	1882		Jorgenson, Edward B.....	1902
<i>Half Moon Bay.</i>			Lackenbach, Fred Isadore, Ph.C	1907
Morgan, Charles Levin.....	1915		Lengfeld, Joseph Louis.....	1909
<i>Long Beach.</i>			Nish, Frederick William.....	1916
Smith, Lauriston Stephen, Ph.G.	1892		Poehner, Adolf Adam, Ph.G.,	
<i>Los Angeles.</i>			M.D.....	1907
Binz, Edward Gabriel.....	1909		Roehr, Clarissa May (Miss)....	1908
Guest, Wilbert Hillman.....	1909		Schmidt, Valentine, B.S., M.S.,	
Henderson, Edward A.....	1918		M.D., Ph.D.....	1887
Howard, Fletcher (Mrs.).....	1905		Schneider, Albert, B.S., M.S.,	
Maas, Arthur R.....	1916		M.D., Ph.D.....	1899
Reilly, Robert C.....	1901		Senecal, Henry C.....	1911
Sauvinet, Charles D.....	1902		Sharp, Solomon A.....	1902
Schiff, Ludwig.....	1912		Smith, Henry Lees.....	1915
Stabler, David J.....	1915		Troxler, Robert Fulton.....	1915
Watters, Alexander John.....	1909		White, Jennie M.....	1914
<i>Mountain View.</i>			White, Joseph Leyden.....	1909
Wagner, Louis.....	1908		Winter, James Henry.....	1904
<i>Oakland.</i>			Woehner, Walter Albert.....	1918
Leet, Robert Andrew.....	1907			

CALIFORNIA—COLORADO—COLUMBIA, DISTRICT OF.

<i>Sanger.</i>	
Brehler, Oscar August.....	1909
<i>San Jose.</i>	
Doerr, Louis.....	1917
Dore, Cornelius W.....	1915
Munson, James Grant.....	1908
Pellerano, Nicholas Andrew.....	1909
<i>San Leandro.</i>	
Thomas, Tony B.....	1916
<i>Santa Cruz.</i>	
Bandell, Chas. Marion.....	1917
Patterson, James Numa.....	1916
<i>Sebastopol.</i>	
Worth, Thomas Renfro.....	1909
<i>Stanford University.</i>	
Merner, Paul Marcus.....	1915
<i>Vacaville.</i>	
Farrell, Anna Marie (Miss).....	1914
<i>Vallejo.</i>	
Hammar, Alrick, Chief Pharmacist, U. S. Navy.....	1897
<i>Ventura.</i>	
Newley, Thomas S.....	1916

COLORADO.

<i>Akron.</i>	
Van Liew, William Kirk.....	1913
<i>Boulder.</i>	
Fine, Eben Givens.....	1913
Loomis, Russell Newton.....	1918
Perusse, Francis Joseph.....	1915
<i>Central City.</i>	
Davies, Llewellyn Powell.....	1891
<i>Colorado City.</i>	
Meyer, Walter Ferdinand.....	1913
<i>Creede.</i>	
Beckmann, Agnes Pauline.....	1918
<i>Denver.</i>	
Alkire, Lewis L.....	1908
Best, John.....	1866
Beukma, William.....	1913
Buengar, Albert.....	1918
Charles, Corlis Duffy.....	1913
Chedister, Percy A.....	1916
Clark, Alfred William.....	1908
Clayton, Charles J.....	1905
Cordes, Henry.....	1913
Earnest, Julius Fischer.....	1917

Engle, Wilber Dwight.....	1917
Hensel, Samuel Theodore, Ph.G.....	1913
Hover, William Adgate.....	1895
Hover, William Tracy.....	1913
Jeancon, Louis Augustus.....	1912
Lord, Frank Jotham.....	1912
Nankivell, John H.....	1919
Patterson, Anne M.....	1915
Pillsbury, Arthur Lee.....	1914
Ryan, Alonzo S.....	1913
Scholtz, Edmund L.....	1909
Scholtz, William O.....	1913
Secheverell, Hugh Bennett.....	1913
Swoboda, Adolph.....	1909
WALBRACH, ARTHUR.....	
1881	
Watson, Robert Gordon.....	1916
Whitmore, George Comings.....	1912
Wilson, Lincoln.....	1910

Fort Collins.

Scott, Alexander Weir.....	1906
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Fowler.

Palmer, William Gordon.....	1909
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Lafayette.

Dow, John Peter.....	1904
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Lamar.

Woods, Samuel Ross, Ph.G.....	1913
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Leadville.

Kolsch, Harry.....	1916
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McKenzie, Robert Henry, Ph.G.....	1908
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Lowviers.

Schenck, Fannie K. (Mrs.).....	1906
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Pueblo.

Mortenson, Frank Emil, Ph.G..	1910
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COLUMBIA, DISTRICT OF.

Washington.

Alsberg, Carl L., A.B., A.M.,	
M.D.....	
1912	
Beall, Herbert Ninian.....	1915
Beucler, William George.....	1915
Bradbury, Wymond Henry,	
Phar.D.....	
1895	
Brown, Clark L.....	1911
Davis, William E.....	1916
DuMez, Andrew Grovor.....	1915
Ewing, Clare O.....	1918
Flemer, Lewis.....	1895
Fuller, Henry Corbin.....	1915

COLUMBIA, DISTRICT OF—CONNECTICUT—DELAWARE—FLORIDA.

Garrels, Charles.....	1914
Henry, Frank Clinton.....	1894
HILTON, SAMUEL LOUIS, PHAR.D.	1890
Kalusowski, Henry E.....	1904
Kebler, Lyman Frederic.....	1894
La Grange, John V., A.M., Ph.G.	1905
Mayo, Redmond.....	1918
Megaw, Herschel.....	1917
Mueller, Norbert R.....	1917
POWER, FREDERICK BELDING....	1872
Quigley, Richard Lucien.....	1902
Rabak, Frank.....	1905
Richardson, Willard Stowell....	1900
Scott, Edgar Burroughs.....	1905
Sencindiver, Judson.....	1918
Sievers, Arthur.....	1906
Smyser, Bert Alexander.....	1918
Stevenson, Arthur Earl.....	1912
Stockberger, Dr. Warren W.....	1914
Stone, Frank Taylor.....	1918
Vane, Patrick P.....	1911
Viehoever, Arno, M.D.....	1915
Weller, Franklin Pierce.....	1900
Wiley, Harvey Washington.....	1902

CONNECTICUT.

<i>Bridgeport.</i>	
Damtoft, Knud J.....	1916
Leverly, John Augustine.....	1900
Ostrosky, Frank Joseph.....	1910
<i>Derby.</i>	
Purdy, Harrison E.....	1916
<i>Hartford.</i>	
Bienstock, Samuel.....	1916
Glaadding, Curtis Parsons.....	1912
Gorman, Chas. F.....	1916
Hockert, Bruno E.....	1916
<i>Meriden.</i>	
Pink, Charles H.....	1916
<i>Middletown.</i>	
Pitt, JOHN RICHARD.....	1872
<i>New Haven.</i>	
Fonteyne, Gustave J.....	1912
GESSNER, EMIL ADOLPH.....	1878
Hull, Chas. T.....	1918
Jenkins, Edward H.....	1913
Wood, James Prior.....	1890
<i>Noank.</i>	
Burrows, Roscoe Tracy.....	1918

<i>Noroton.</i>	
Gilbert, Cyrus Thurston.....	1913
<i>Norwalk.</i>	
Glendering, Harold.....	1915
<i>Norwich.</i>	
Lerou, Herbert M.....	1916
<i>Southport.</i>	
Switzer, Luin Burt.....	1916
<i>Stamford.</i>	
Weicker, Theodore.....	1905
Winski, Frank B.....	1916
<i>Stratford.</i>	
Brill, Frederic Bernhard.....	1916
<i>Waterbury.</i>	
Newton, Clark H. W.....	1916
Wilcox, Levi, Ph.B.....	1903
<i>Willimantic.</i>	
Cartier, Gustave O.....	1913

DELAWARE.

<i>Newark.</i>	
Rhodes, George W.....	1915
<i>Seaford.</i>	
Kaufman, Reuben M., Ph.G....	1909
<i>Smyrna.</i>	
Rose, William Wilson.....	1918
<i>Wilmington.</i>	
Bosley, John Oliver.....	1914
WATSON, HERBERT KENNEDY...	1888

FLORIDA.

<i>Bowling Green.</i>	
Adler, Max S.....	1919
<i>Brooksville.</i>	
Chelf, Roy N.....	1918
Lemasters, William Otterbein...	1905
<i>Daytona.</i>	
Hankins, W. M.....	1918
Seaman, Frederick Anthony....	1905
<i>De Land.</i>	
Fisher, George Washington.....	1893
<i>Fort Myers.</i>	
Hunter, N. H.....	1918
<i>Jacksonville.</i>	
Mahoney, Wilber Alexander....	1916
Ramsaur, David Wilfong.....	1902
<i>Key West.</i>	
Filer, Samuel S.....	1918
Miller, Charles.....	1897

FLORIDA—GEORGIA—HAWAIIAN ISLANDS—IDAHO—ILLINOIS.

<i>Miami.</i>	
Perry, Wm. George.....	1918
<i>Orlando.</i>	
Estes, Vernon Wilson.....	1918
<i>Pensacola.</i>	
D'Alemberte, Herbert Harry....	1915
Hannah, Malcolm E.....	1914
Owen, Charles Herbert.....	1916
Petterson, Ernest Wilhelm.....	1905
Rawls, William Andrew.....	1918
Russell, Hamilton.....	1918
White, Walter H.....	1918
<i>Tallahassee.</i>	
Henry, Arthur Malcolm, B.S....	1913
<i>Tampa.</i>	
Berger, Ernest.....	1902
Bize, Marshall L.....	1918
Hale, Leon P.....	1918
Johnson, Chas. S.....	1918
Monroe, Harley R.....	1916
Taylor, M. M.....	1918

GEORGIA.

<i>Athens.</i>	
Wilson, Robert C.....	1915
<i>Atlanta.</i>	
Cox, Eugene H.....	1916
Jacobs, Sinclair Sartorius.....	1915
Payne, Dr. George Frederick....	1893
<i>Augusta.</i>	
Land, Robert Henry, Jr.....	1902
<i>Savannah.</i>	
Roehrig, Albert Michael, Ph.G..	1902
Rowlinski, Robert Antone.....	1892
Solomons, Isaiah Abraham.....	1894
Solomons, Isaiah, Jr.....	1913
<i>Thomasville.</i>	
Mash, Henry Terrell, Jr.....	1917
Melton, Hearn Howell.....	1919
Thomas, Robert, Jr.....	1888

HAWAIIAN ISLANDS.

<i>Honolulu.</i>	
Smith, George Waterman.....	1915

IDAHO.

<i>Boise.</i>	
Ballou, Clarence Orlando.....	1909

Pocatello.

Buehler, John J.....	1913
Whittlesey, Henry Hawley.....	1910
<i>Twin Falls.</i>	
Spargur, Roy Miles.....	1910
<i>Wendell.</i>	
Bowles, Henry Edward.....	1919

ILLINOIS.

Aurora.

Benton, L. N.....	1918
Eberly, Ralph Milton.....	1918
Frauenhoff, Frederick Louis,	
Ph.G.....	1909
Staudt, Louis Carl, Ph.G.....	1890

Batavia.

Schreiner, Albert.....	1914
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Cairo.

Lehning, Fred P.....	1919
Schuh, Herman C.....	1916
Schuh, Paul Gustav.....	1894

Canton.

Webster, Richard C.....	1914
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Carlinville.

Graham, Frank William.....	1916
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Chicago.

Abrahamson, Carl.....	1918
Ackermann, Albert George	
Ph.G.....	1909
Adamick, Gustave Hattenhauer.	1891
Ahlborn, Frank H.....	1918
Altstadt, Benjamin W.....	1917
Antonow, Samuel L.....	1918
Avery, Charles Hamilton.....	1905
Baird, Howard G.....	1919
Bakkers, Mrs. Neff K.....	1918
Bane, Robert Lyle.....	1919
Bangert, Howard Wells.....	1919
Bangert, Louis Edward.....	1919
Bartlett, James E.....	1906
Beavo, Mabel S. (Mrs.).....	1918
Becker, Irwin Atwood, B.S.,	
Ph.G.....	1905
Behrens, Emil Christian Lewis..	1893
Bellack, Julius S.....	1918
Blocki, John.....	1909
Bodemann, Wilhelm.....	1906
Boehm, John J.....	1905

ILLINOIS.

Brockhoff, Lewis Paul.....	1919	Haering, Geo. V.....	1918
Bruun, Harold Nichalai.....	1905	Haeseler, Loren M.....	1906
Burda, Stanislaus W.....	1916	Hartwig, Otto Julius.....	1892
Burdick, Alfred S., M.D.....	1913	Hellmuth, Joseph Anthony.....	1905
Burdick, Merle M.....	1913	Henry, Samuel Clements.....	1909
Buss, Oliver C.....	1915	Hermanek, Joseph Charles.....	1904
Caldwell, A. C.....	1915	Hilpert, Willis Stose.....	1908
Canham, George E.....	1915	Holthoefer, Herman John.....	1912
Chez, Isidore Edward.....	1918	Hoover, George William.....	1905
Christensen, Henry C.....	1906	Hottinger, Otto George.....	1910
Chwatal, John J.....	1916	Hunsche, Frederick.....	1915
Clark, Albert Henry, Ph.G.....	1905	Jacobson, Michael.....	1918
Clarke, Stanley C.....	1917	Jehlik, Anton Josef.....	1906
Combs, Delta E.....	1911	Jennings, Ralph Crawford.....	1915
Crowley, James Patrick.....	1908	Johnson, P. Ellsworth.....	1919
Datz, Charles Percival.....	1916	Josenhans, Reinhardt C. J., Ph.C.....	1907
Day, William Baker, Phar.M.....	1895	Kaplan, Samuel Solman.....	1918
Dedic, Libbey (Miss).....	1919	Kartman, Nathan.....	1919
Druehl, Amanda Stahl.....	1916	Keim, Raoul D.....	1916
Dubsky, Frank J.....	1918	Knight, Chas. G.....	1918
Dubsky, Joseph E.....	1918	Kogon, S. P.....	1918
Dyniewicz, Hattie Adela (Miss)	1919	Kolar, Gustav S.....	1918
Dyniewicz, Josephine Marion (Miss).....	1919	Kolb, Philip Jacob.....	1918
Echols, Robert Templeton.....	1918	Kozlowski, Boleslaw.....	1919
Elisburg, Louis A.....	1913	Kraemer, Frank W.....	1918
Elliott, Victor Alfred.....	1919	Kraemer, George Charles.....	1913
Engelhard, George P.....	1919	Krizan, John.....	1918
Fantus, Bernard, M.D.....	1908	Kurrasch, Albert A.....	1918
Fechter, Arthur E.....	1918	Ladish, Erich Herman.....	1905
Fenger, Frederic.....	1910	Larsen, L. P., Ph.G.....	1908
Frase, Karl W.....	1919	Light, Isam M.....	1918
Fritschel, Arno Wm.....	1919	Lindh, Berger.....	1918
Fry, Herman.....	1902	Loesch, William, Ph.G.....	1912
Fry, Narcys George.....	1906	Maguire, Andrew.....	1918
FULLER, OLIVER FRANKLIN.....	1869	Mandabach, Peter A.....	1918
Galloway, J. B.....	1917	Mares, Frank Martin, Ph.G.....	1902
Gathercoal, Edmund Norris, Ph.G.....	1905	Matthews, Charles Edward.....	1893
Gazzolo, Frank Henry.....	1917	Mawrence, Israel.....	1916
Gibney, E. Paul.....	1918	McCausland, Harloven H.....	1913
Ginsburg, Sylvia (Miss).....	1918	McClugage, John J.....	1918
Gordin, Henry Mann, Ph.D.....	1899	McCracken, H. S.....	1918
Gordon, Jean (Miss).....	1914	McDaniel, Gerald Litton.....	1919
Gray, Margaret McClintock (Mrs).....	1901	Mentz, Otto Herman.....	1916
GRAY, WILLIAM.....	1892	Meyer, Frederic Hugo.....	1907
Grund, Chas. H., Jr.....	1918	Mick, John George.....	1918
		Miller, Albert, Ph.G.....	1907
		MINER, MAURICE A., PHAR.M.....	1880

ILLINOIS.

Morrison, James William.....	1912	Topf, Jacob A.....	1918
Morrison, Warren Dale.....	1918	Trienens, Joseph.....	1915
Moyer, Harry T.....	1918	Umenhofer, Adolph.....	1908
Mrazek, Leo Ludwig.....	1914	Vahlteich, Hans Walter.....	1918
Naviaux, Ernest Louis.....	1918	Van Schaack, Cornelius Peter...	1905
O'Neill, Wm.....	1918	Vaupell, George F., Ph.C.....	1915
Patterson, Charles Waggener...	1905	VOISS, ARCADIUS.....	1901
<i>Patterson, Theodore Henry</i>	1869	Von Hermann, Eugene.....	1918
Peckham, William G.....	1916	Vorsanger, Lillian.....	1915
Peska, Alexander C.....	1918	Warner, Carl A.....	1919
Potts, Thomas Humphreys.....	1906	Wells, James Herbert, Ph.G.,	
Puckner, William August, Ph.G.		LL.B.....	1908
Phar.D.....	1888	Whidden, Ray Allen.....	1918
Rauschert, Emil P.....	1918	Wilhelm, Werner F.....	1919
Rhode, Rudolph Ernst.....	1887	WILLIAMS, SEWARD WHITING,	
Riemenschneider, Julius H.....	1915	PhC., F.C.S.....	1887
Ruder, Rose Scheele (Mrs.)....	1918	Wood, George W.....	1918
Runkel, Julia.....	1919	Young, Fred H.....	1913
Russell, Hugh C.....	1916	Zoeller, Geo.....	1918
Sass, Stephen Konrad.....	1905	<i>Cowden.</i>	
Scherer, Andrew, Ph.G.....	1884	Jones, Harold V.....	1919
Schmid, Rose Phillipus.....	1911	<i>Danville.</i>	
Schmidt, Florian Joseph.....	1918	Baum, William Franklin.....	1915
Schobert, Rudolph Johannes....	1918	<i>Du Quoin.</i>	
Schrage, Frank.....	1918	Bianco, Mike Robert.....	1915
Searle, C. H.....	1918	<i>East St. Louis.</i>	
Secord, George Louis, M.S.,		Skye, Francis Josephus.....	1918
Phar.D.....	1910	<i>Elgin.</i>	
Seuring, Carl A.....	1918	Schultz, Charles Frederick Wm.	1911
Shapiro, Leo Harold.....	1917	<i>Evanston.</i>	
Sheblessy, Michael Albert.....	1909	Doolittle, Roscoe Edward, B.S.,	1909
Shippy, Earl F.....	1917	Lee, John Victor.....	1910
Sisson, Oscar U.....	1918	<i>Fairmount.</i>	
Sister Mary Wilhelmina.....	1919	Tilton, Claude Enoch.....	1905
Skelton, Maurice B.....	1919	<i>Forest Park.</i>	
Snow, Clyde Mason, Ph.G.,		Jacob, Charles William.....	1914
M.A.....	1903	<i>Freeport.</i>	
Snyder, Forrest Omo.....	1915	Haines, Drexel W.....	1918
Snyder, William Edward, Ph.G..	1909	McNess, Frederick Wm., P.D.,	1906
Stadelmann, Arthur W.....	1918	<i>Geneseo.</i>	
Stadelmann, Harry Edgar.....	1909	Stamm, Dante Milton.....	1896
Stecker, Henry F.....	1918	<i>Glen Ellyn.</i>	
Stephen, Otto Paul, Ph.G.....	1909	Utt, Alfred Reuben.....	1919
Stieber, F. G. J.....	1918	<i>Grayville.</i>	
Storer, Charles Adelbert.....	1906	Wheatcroft, John Christopher...	1912
Stuchlik, John.....	1913	<i>Great Lakes.</i>	
Swanson, Joseph Allen.....	1919	Bernhard, Albert Henry.....	1918
Tabenski, Longin, Ph.G., M.D..	1915	Bote, Lester Elmer.....	1916

ILLINOIS—INDIANA.

Crain, George Lawrence.....	1916		<i>Pesotum.</i>	
Dean, Corliss Page, H. S., U. S. N.....	1917	Hoffman, George Frederick, Ph.G.....		1902
Link, Alexander J.....	1917		<i>Quincy.</i>	
<i>Greenup.</i>		Dickhut, Lawrence August, Ph.G.....		1910
Conzet, Rufus Warren.....	1904	Hagemann, William Herman Ph.G.....		1910
<i>Harrisburg.</i>		Konantz, William A.....		1916
Gregg, Thos. D.....	1914	<i>Rockford.</i>		
<i>Highland Park.</i>		Elliott, Charles S.....		1914
Gsell, Earl W.....	1917	<i>Rock Island.</i>		
<i>Jacksonville.</i>		Hartz, William Theodore.....		1909
Armstrong, Byron.....	1917	<i>Salem.</i>		
<i>Joliet.</i>		Sweeney, A. J.....		1911
Schick, Sebastian Fabian.....	1918	<i>South Chicago.</i>		
<i>Kirkland.</i>		Wyszynski, Walter H.....		1916
Zuck, F. J.....	1916	<i>Springfield.</i>		
<i>LaSalle.</i>		Dodds, Frederick Clinton.....		1918
Clancy, William J.....	1915	Dodds, Richard Newton.....		1902
<i>Mascoutah.</i>		Metzger, Fred W.....		1916
Dauber, Curt Louis.....	1913	Sister Theresa.....		1917
<i>Metropolis.</i>		<i>Stronghurst, Henderson Co.</i>		
Humma, Henry Hermann.....	1917	Harter, Isaac Foster, M.D.....		1893
Humma, James Bernard.....	1919	<i>Tuscola.</i>		
<i>Moline.</i>		Stacy, Marion Franklin.....		1903
Anderson, Adolph Emil.....	1913	<i>Urbana.</i>		
Brunstrom, Charles, Ph.G.....	1912	Beal, George Denton.....		1907
Doden, J. R.....	1918	Beal, James H., Sc.D., Phar.D..		1892
Lindvall, Charles Gustaf.....	1897	Bennett, George M.....		1918
Sohrbeck, George Henry.....	1888	Creighton, Mary L. (Miss).....		1903
Sohrbeck, George Wm., Ph.G....	1897	<i>Waukegan,</i>		
<i>Oak Park.</i>		Breves, Rudolph.....		1916
Gram, Wm. J. B.....	1918	<i>Wyoming.</i>		
Honens, Hugh Benton.....	1918	White, Harry A.....		1918
Huston, Lotis Loma.....	1918		<i>INDIANA.</i>	
McCauley, Charles Edward.....	1903		<i>Albion.</i>	
Zwick, Mary Hall (Mrs.).....	1914	Bidwell, Charles.....		1917
<i>Ottawa.</i>		Miller, Chas. Elliott.....		1899
Duncan, Wm. D.....	1918	<i>Angola.</i>		
Formhals, Wallace Joseph.....	1919	Sherrard, Charles Cornell.....		1893
<i>Peoria.</i>		<i>Bloomington.</i>		
Benton, Wilbur Merritt.....	1888	Wiles, Wood.....		1914
Eichenberger, William Samuel...	1916	<i>Bluffton.</i>		
Norris, William Peter.....	1918	Spivay, James R.....		1918
Roesener, Walter C.....	1915	Stout, Marion Alphon, Ph.G....		1906
Schmidt, A. Elsa.....	1918			
Weinkauff, Jacob.....	1914			

INDIANA.

<i>Broad Ripple.</i>		Lilly, Eli.....	1906
Taylor, Irvan E.....	1917	Lilly, Josiah Kirby.....	1890
<i>Converse.</i>		Lilly, Josiah Kirby, Jr.....	1916
Gift, Wendell J.....	1913	Lynn, Charles Jackson.....	1906
<i>Crown Point.</i>		Miller, Ivy Lowell.....	1912
Scheddell, Wm. Allen.....	1918	Mueller, J. George.....	1906
<i>Elkhart.</i>		Niles, Edward Hulbert.....	1914
Beardsley, Andrew H.....	1913	Noel, Harry Sumner.....	1917
<i>Evansville.</i>		Parker, Mayne E.....	1915
Bohn, George W.....	1907	Pfafflin, Henry Adolph.....	1892
Brown, George Wilton.....	1914	Pruyn, Murry K.....	1912
Hardigg, William L.....	1913	Reick, Edward C.....	1918
<i>Ft. Wayne.</i>		Rhodehamel, Harley Wesley....	1916
Emanuel, Julia Esther (Miss)...	1918	Schwartz, Maurice Paul.....	1906
<i>Gary.</i>		Schwarz, Leonard J.....	1918
Honorof, Peter.....	1918	Seybert, John Edward.....	1916
Meyer, Frank B.....	1918	Showalter, Ralph W.....	1913
<i>Hammond.</i>		Smith, Herbert Alexander.....	1917
Steinhardt, Benjamin.....	1919	Stahlhuth, Ernst.....	1919
<i>Indianapolis.</i>		Stokes, John Wesley.....	1917
Anderson, Charles Wm.....	1918	Strawn, May (Miss), Ph.C.....	1912
Barnard, Harry E.....	1918	Stucky, Edward W., Ph.B., A.M.,	1908
Bartholomew, William C.....	1913	Swanson, Edward Edwin.....	1918
Bibbins, Francis Eugene, Ph.G..	1909	Tanke, Clayton E.....	1917
Blodau, Robert P.....	1908	Thorburn, Albert David.....	1902
Borst, Harry J.....	1917	Thurston, Emory W.....	1915
Burrin, Philo LaMont.....	1919	Vestal, John Wilfred.....	1916
Carter, Edgar B.....	1916	Warner, Cortice M.....	1916
Carter, Frank Henry.....	1891	Watkins, Charles William.....	1907
Carter, Harlem Wilson Searight.	1913	Werner, William F.....	1908
Eberhardt, Ernest Godlove,		Wildman, Ernest Atkins.....	1917
Ph.G.....	1906	Wright, John Shepard.....	1916
Eckler, Charles Ralph.....	1903	<i>Kouts.</i>	
Eldred, Frank Randall.....	1905	Benkie, John Gottlieb.....	1910
Etter, Robert B.....	1917	<i>Lafayette.</i>	
Fisk, Frank Byron.....	1916	Best, Frank Merrell.....	1914
Gray, Harold.....	1918	Jordan, Charles B., Ph.C., B.S.,	
Hargreaves, Chester Chas.....	1918	M.S.....	1909
Hartman, Joseph E.....	1918	Lee, Charles O.....	1915
Hoff, Karl Wm.....	1917	Yeager, Emory James.....	1918
Huder, Henry J.....	1894	<i>La Porte.</i>	
Hurty, John Newell, M.D.,		Meissner, Frederick William, Jr.,	
Phar.D.....	1882	Ph.G.....	1890
Jamieson, Walter Albert.....	1918	<i>Logansport.</i>	
Kassulke, August.....	1905	Hoffmann, George William.....	1904
Keene, Bernard M.....	1918	<i>Martinsville.</i>	
Lawson, Chas. E.....	1916	May, Edwin W.....	1914
Leth, Eric Gunnar.....	1916		

INDIANA—IOWA.

<i>Notre Dame.</i>		<i>Cedar Rapids.</i>	
Green, Robert Lee.....	1906	Meister, Edward James.....	1918
<i>Rushville.</i>		<i>Clear Lake.</i>	
Wilson, Charles Frazee.....	1906	Etzel, John Leonhardt.....	1897
<i>Salem.</i>		<i>Davenport.</i>	
Rudder, William Hiram, Ph.G....	1907	BALLARD, JOHN WINTHROP,	
<i>Seymour.</i>		PH.G.....	1871
Loertz, Carl Edward.....	1907	Burnside, Carl Bishop.....	1913
Osterman, Henry.....	1914	Wierks, Clarence.....	1918
<i>South Bend.</i>		<i>Denison.</i>	
Reyer, Emil, Ph.G.....	1907	Schlumberger, Anna Babette....	1913
<i>Terre Haute.</i>		Schlumberger, Philip August....	1911
Zimmerman, Theophilus.....	1914	<i>Des Moines.</i>	
<i>Tipton.</i>		Berner, Carl Albert.....	1903
Porter, Jesse G.....	1915	Ellyson, G.....	1916
<i>Troy.</i>		Gschwender, Paul.....	1918
Gaesser, Theobald Theodore,		Heidenreich, Arthur C.....	1916
Ph.G.....	1901	Kagy, Elbert O., Ph.G., Ph.C....	1913
<i>Union City.</i>		Weeks, Carl.....	1915
Tibbetts, Wm. Harris.....	1918	<i>Doon.</i>	
<i>Valparaiso.</i>		Glissman, Hugo R.....	1918
Carpenter, Mrs. Tom.....	1918	<i>Dubuque.</i>	
Cox, Cyrus L.....	1919	Falkenhainer, Chas.....	1918
Heinemann, Albert F.....	1905	<i>Elma.</i>	
Wisner, Ebert H.....	1914	Gross, E. Orville.....	1916
<i>Wakarusa.</i>		<i>Fayette.</i>	
Stewart, Russell Myers.....	1918	Davis, Frank J.....	1918
<i>Warren.</i>		<i>Ft. Dodge.</i>	
Hickerson, William Henry.....	1894	OLESON, OLAF MARTIN.....	1877
<i>West Lafayette.</i>		<i>Ft. Madison.</i>	
Hess, Leon Ralph.....	1916	SCHAFER, GEORGE HENRY.....	1871
<i>West Terre Haute.</i>		<i>Garnerello.</i>	
Cassady, Burton.....	1909	Wilke, Lester W.....	1918
<i>IOWA.</i>		<i>Holstein.</i>	
<i>Algona.</i>		Watts, Thomas McCoy.....	
Falkenhainer, Albert.....	1916	<i>Hull.</i>	
<i>Amana.</i>		Coad, William A.....	1911
Miller, Frederick William.....	1902	<i>Iowa City.</i>	
<i>Ames.</i>		BOERNER, EMIL LOUIS.....	1877
Judisch, George.....	1913	Cooper, Zada Mary (Miss), Ph.G.	1909
<i>Anthon.</i>		Doden, Herbert F.....	1909
McNiff, Frank J.....	1915	Greenblatt, Benjamin.....	1918
<i>Burlington.</i>		Keuver, Rudolph A., Ph.G., Ph.C.	1912
Sutter, Joseph R.....	1915	Teeters, Wilber John.....	1902
<i>Callendar.</i>		<i>Irwin.</i>	
Larson, Martin.....	1906	Pexton, Frederick Schuyler.....	1915
		<i>Keokuk.</i>	
		Kiedaisch, George Arthur.....	1904

IOWA—KANSAS—KENTUCKY—LOUISIANA.

<i>Maquoketa.</i>		<i>Winfield.</i>	
Staack, Hugo F.....	1915	Bird, Richard B.....	1910
<i>Muscatine.</i>		Friedenburg, Maximillian Wilmer	1904
Halstead, Alice Louisa, Ph.G. (Mrs.).....	1892	KENTUCKY.	
<i>Odebolt.</i>		<i>Anchorage.</i>	
Bergren, Elvin R.....	1916	Hausgen, Henry Otto.....	1915
<i>Red Oak.</i>		<i>Augusta.</i>	
Casey, D. W.....	1915	Bertrams, Henry.....	1914
<i>Sioux City.</i>		<i>Covington.</i>	
SCHERLING, GUSTAV, Ph.G.....	1884	Eichler, Henry.....	1913
Soper, George M.....	1909	Hauser, Chas. A.....	1918
Thompson, Edwin Thomas.....	1913	Kyser, Edward Vernon.....	1918
Toller, Adolph J.....	1915	Pieck, Edward Ludwig.....	1897
<i>Winfield.</i>		<i>Frankfort.</i>	
Lindley, John Milton, Ph.G....	1901	Gayle, John William.....	1891
KANSAS.		<i>Hawesville.</i>	
<i>Atchison.</i>		Patterson, George Orville.....	1907
Noll, Mathias.....	1918	<i>Henderson.</i>	
<i>El Dorado.</i>		Elam, John Thomas.....	1907
Hron, Ralph Preston.....	1915	<i>Lexington.</i>	
<i>Gypsum.</i>		Brown, Linwood Arnold, Ph.C., Phar.D.....	1909
Schmitter, Jonathan.....	1918	Harting, Rudolph R.....	1902
<i>Havana.</i>		Porter, Chilton Scott.....	1914
Lindley, Patrick H.....	1913	<i>Louisville.</i>	
<i>Kansas City.</i>		Buschemeyer, Henry.....	1909
Lake, Gillis Q.....	1918	Dilly, Oscar Charles.....	1888
<i>Lawrence.</i>		Dimmitt, Addison.....	1895
Havenhill, L. D.....	1900	Frick, Robert J.....	1915
Moore, John Thomas.....	1888	Hulskamp, Clara C.....	1918
Sayre, Lucius Elmer.....	1883	Hurley, Horace Oliver.....	1907
Sterling, Charles Morgan, A.B....	1911	JONES, SIMON NEWTON.....	1870
Varnum, Walter Howard.....	1912	Miersch, Rudolph Victor.....	1907
Watson, George Nathaniel.....	1910	Mueller, Otto Edward.....	1907
<i>Lucas.</i>		NEWMAN, GEORGE ABNER.....	1866
McEckron, George Milton.....	1916	Suter, Arthur Lee.....	1915
<i>Marysville.</i>		Votteler, William.....	1895
Riesen, David V.....	1909	<i>Newport.</i>	
<i>Ottawa.</i>		Blank, Nicholas J.....	1915
Dorsey, Maurice Edward.....	1916	Greule, Albert Martin.....	1903
<i>Overbrook.</i>		Hoyer, Benjamin.....	1916
Topping, Arthur Ellsworth, Ph.G.....	1904	Widsig, T. J.....	1915
<i>Wichita.</i>		<i>Owensboro.</i>	
Chism, John Samuel, Ph.G.....	1909	Danhauer, William Edward.....	1914
Fields, J. Larkin.....	1915	LOUISIANA.	
		<i>Donaldsonville.</i>	
		Baudin, Lucius C.....	1919

LOUISIANA—MAINE—MARYLAND.

<i>Kaplon.</i>		<i>Biddleford.</i>	
Eleazar, E.....	1918	Fortin, Emile A., M.D.....	1916
<i>Merryville.</i>		<i>Danforth.</i>	
Smith, Denette Weymouth.....	1919	Porter, Martin Luther, M.D....	1904
<i>Monroe.</i>		<i>Dexter.</i>	
Collens, John W.....	1915	Bullard, Morton Leonard.....	1917
<i>New Iberia.</i>		<i>Fort Fairchild.</i>	
Segura, Jacob S.....	1917	Buxton, Horace Childs.....	1910
<i>New Orleans.</i>		<i>Kennebunk.</i>	
Arnaud, Adrian Andrew.....	1918	Meserve, Albert Wesley, A.M.,	
Asher, Philip.....	1905	B.A.....	1905
Calderaro, August.....	1919	<i>Lewiston.</i>	
Callaghan, Frank M.....	1919	Alden, Harley Roscoe.....	1915
Capdan, Hypolyte E.....	1919	Babcock, Percival Warren.....	1909
Castiex, Martial B.....	1918	Dussault, Arthur.....	1916
Clay, Cassius Lovelace.....	1918	<i>Machias.</i>	
Darling, Oscar.....	1918	Crane, Frank Trussell, Ph.G....	1910
Daste, Eugene H.....	1918	<i>Portland.</i>	
Elmer, Oscar Baker.....	1918	Broe, James Augustin.....	1917
Freund, Paul.....	1917	Cook, Alfred Page.....	1902
Godbold, Fabius Chapman.....	1887	FRYE, GEORGE CARLTON.....	1879
Grace, Robert F.....	1914	Hay, Edward Allston.....	1899
Grasser, John J.....	1918	Rankin, George W.....	1915
Kaczoroski, Adolph O.....	1909	Schlotterbeck, Augustus George..	1896
Legendre, Joseph Amilcar.....	1891	Tuttle, George O.....	1907
Lyons, Lucien Eugene.....	1904	<i>South Paris.</i>	
Metz, Abraham Lewis.....	1887	Howard, Chas. H.....	1915
Murphy, John B.....	1919	<i>Yarmouthville.</i>	
Nuccio, Frank Joseph.....	1918	Ring, Harry E.....	1916
Nutter, Albert M.....	1919	MARYLAND.	
Purel, Victor Honore.....	1918	<i>Arlington.</i>	
Samson, Max.....	1900	Roberts, Jos. C.....	1910
Schertz, Christian.....	1916	<i>Baltimore.</i>	
Smith, Louis Clarence.....	1919	Base, Daniel, A.B., Ph.D.....	1898
Walsorf, Edward H.....	1904	Black, James Aitken, Phar.D....	1910
Welsch, Henry.....	1916	Boyles, Frank Morris.....	1914
Wirth, Adam, Ph.M.....	1904	BRACK, CHARLES EMIL.....	1876
Wunderlich, Edward.....	1891	Burger, Louis J.....	1915
MAINE.		Cole, Bessie Olive (Miss).....	1915
<i>Auburn.</i>		Colson, Henry C., Jr.....	1917
Jones, Oscar Winthrop.....	1902	Cook, Parker.....	1910
<i>Augusta.</i>		CULBRETH, DAVID MARVEL REY-	
Coughlin, John.....	1908	NOLDS.....	1883
Partridge, Frank Reuben.....	1895	Daneker, Howard Nelson.....	1907
<i>Bangor.</i>		Dickson, Frederick W.....	1906
Davis, Charles Howard.....	1903	Dohme, Alfred Robert Louis....	1891
SWEET, CALDWELL.....	1881	Donnet, John Smith.....	1915

MARYLAND—MASSACHUSETTS.

Dunning, Henry Armit Brown, Phar.D.....	1902
Englehardt, Hermann.....	1907
Fouch, William M.....	1906
Frames, John Fuller, Ph.G.....	1890
Gilpin, Henry Brooke.....	1889
Hancock, James Etchberger.....	1907
HANCOCK, JOHN FRANCIS.....	1863
Heusler, Philip Ignatius.....	1903
Hindes, Joseph Frey.....	1910
Hodson, Eugene Withers.....	1907
Hynson, Henry Parr.....	1890
Kantner, Leahmer M.....	1914
Kelly, Evander Frank, Phar.D...	1905
Lotz, Emma Grace.....	1916
Lowry, William J., Jr.....	1906
Meyer, Charles Lewis.....	1901
Morgan, Charles.....	1899
Muehlause, Otto W.....	1915
Muth, George Giustiniani.....	1906
Muth, John Clement.....	1898
Neal, Charles Chaplin.....	1906
Schlosser, Roy B., Ph.G.....	1916
Schollenberger, William Watts..	1919
Schulze, Louis, Ph.G.....	1892
Schulze, Wilmer H., Phar.D.....	1916
Smith, Theodorick.....	1890
Sonnenburg, Amelia Adelaide...	1918
Stier, Carl, Ph.G.....	1902
Sullivan, John Patrick.....	1909
Thomas, John Benjamin.....	1906
Walz, Jacob Lee.....	1906
Werckshagen, Otto.....	1907
Westcott, James Walling, Ph.G...	1890
White, Pinkney McGill.....	1915
Wich, Henry Edward.....	1909
Williams, Lawrence Soper.....	1910
WINKLEMANN, JOHN HENRY.....	1864
Wolf, Charles Augustus.....	1906
Wolf, James Carlton.....	1905
<i>Berlin.</i>	
Farlow, John H.....	1919
<i>Cumberland.</i>	
Holtzmann, Charles Hanson.....	1911
<i>Frederick.</i>	
Pearre, Albert Lindsay.....	1906
Williamson, Thomas M.....	1916

<i>Frostburg.</i>	
Pearce, George Ellsworth.....	1911
<i>Hagerstown.</i>	
Meredith, Harry Lionel.....	1900
Schindel, David P.....	1914
<i>Mt. Rainier.</i>	
Spire, William Barton, Phar.D...	1908
<i>Salisbury.</i>	
White, Edward Riall.....	1911
<i>Snow Hill.</i>	
Powell, William Cottingham....	1895
<i>Sykesville.</i>	
Swain, Robert Lee.....	1909
<i>Taneytown.</i>	
McKinney, Robert Sentman, Ph.G.....	1898

MASSACHUSETTS.

<i>Allston.</i>	
Boas, Auguste.....	1915
Foulser, Stanley Wm.....	1918
Gilmore, Mildred Lillian.....	1919
Jarrett, Wm. Ambrose.....	1918
Pendleton, Clarence Isaac.....	1915
<i>Beverly.</i>	
Delaney, Thomas F.....	1910
<i>Boston.</i>	
Allard, Herman Joseph.....	1914
Amrheim, Florin Joseph.....	1915
Ayers, John Raymond, Jr.....	1914
BASSETT, CHARLES HARRISON, PH.G.....	1867
Bradley, Theodore James.....	1896
Brown, Arthur Nutter.....	1918
Burnham, Alfred Augustus, Jr..	1891
Carter, Fred. Louis.....	1905
Cohan, Jacob Joseph.....	1918
Correa, John Francis, Jr.....	1914
Doliber, Franklin W.....	1914
Dyer, Nicholas F.....	1914
Finneran, James Francis.....	1906
Geddes, Lillian M. (Mrs.).....	1912
Gifford, Edward Rudy.....	1915
GODDING, JOHN GRANVILLE, PH.G.....	1875
Goodwin, Howard.....	1910
Griffin, Lyman Whiting.....	1907
Hunt, Reid.....	1904

MASSACHUSETTS.

Lyons, Michael Francis.....	1910		<i>Dorchester Center.</i>	
McIntire, Martin J.....	1910	Coleman, George Edward.....		1912
Merrill, Edward C.....	1914		<i>East Boston.</i>	
Monnier, Ernest.....	1913	Packard, Charles Herbert.....		1906
Muldoon, Hugh Cornelius, Ph.G.	1913		<i>Everett.</i>	
O'Brien, James M.....	1910	Wagner, Arthur Carl.....		1907
PIERCE, WILLIAM HERBERT.....	1879		<i>Fall River.</i>	
Sampanis, Argiris Geo.....	1918	Brunelle, Albert Joseph.....		1910
Smith, Howard Harry, Ph.G.,		Corrigan, Dominick F.....		1912
M.D.....	1911		<i>Fitchburg.</i>	
Stachli, Theodore Hermann.....	1912	Estabrook, Henry Arthur.....		1886
Tailby, J. Allen.....	1918		<i>Gardner.</i>	
Thompson, Leon Albert, Phar.D.	1907	Carroll, Geo. J.....		1914
Tobin, John J.....	1914		<i>Gloucester.</i>	
West, Charles Alfred.....	1892	Barker, Fred A.....		1914
Wiggin, Harry Carleton.....	1910		<i>Great Barrington.</i>	
Witt, Charles T. A.....	1916	Harper, John.....		1915
Wolff, D. O.....	1916		<i>Holyoke.</i>	
Wooten, Thomas Victor, Ph.G....	1893	Heinritz, Lebrecht Gustav.....		1902
	<i>Brighton.</i>		<i>Hudson.</i>	
McCormick, Peter Joseph.....	1909	Wheeler, Carlton Bancroft,		
	<i>Brockton.</i>	Phar.D.....		1907
Braconier, Frank Gunmar, Ph.G.	1916		<i>Jamaica Plain.</i>	
Fitz-Simon Vincent Joseph.....	1918	Biesty, Patrick Joseph.....		1918
	<i>Brookline.</i>	Lewis, Ernest Grant.....		1892
Clapp, Lowell Tuckerman.....	1905	Smith, Linville Holten.....		1892
Gammon, Irving Parker.....	1906		<i>Lawrence.</i>	
Hitchcock, Charles H.....	1910	Call, Harry Barrett.....		1909
Vargas, Heredis Jorge.....	1891	Glover, William Henry, Ph.G....		1891
	<i>Cambridge.</i>		<i>Leominster.</i>	
Acheson, William Robert.....	1910	Charron, Roy Chester.....		1915
Ford, Charles Mangan.....	1887	Nixon, Charles Frederick, Ph.G.		1900
Hawthorne, Herman Francis....	1909		<i>Lowell.</i>	
LaPierre, Eli Henry, Ph.G.....	1892	Donoghue, Richard Sheridan....		1910
Norton, George Edward.....	1895	HOOD, CHARLES IRA.....		1871
SHAPLES, STEVEN PASCHALL,			<i>Lynn.</i>	
S.B.....	1875	Ackermann, Adolf Henry,		
Stover, Charles Albert, Ph.G....	1909	Phar.D.....		1910
	<i>Camp Devens.</i>	Ellis, Leon Clifton.....		1918
Mulford, Henry Kendall, Jr.....	1916		<i>Melrose.</i>	
	<i>Chelsea.</i>	Ripley, Henry Milton.....		1910
Armstrong, Thomas Call.....	1915		<i>New Bedford.</i>	
	<i>Chicopee.</i>	SHURTLEFF, ISRAEL HAMMOND...		1875
Dalton, Ernest.....	1913		<i>Newburyport.</i>	
	<i>Clinton.</i>	Davis, Charles Leland, Ph.G....		1897
Burdette, Bernard Clarence.....	1911		<i>Newton.</i>	
	<i>Dorchester.</i>	Hudson, Arthur.....		1882
Archer, Frederick.....	1913	WILSON, BENJAMIN OSGOOD.....		1859

<i>Newton Center.</i>	
Hahn, William.....	1910
<i>North Andover.</i>	
Perkins, George H.....	1917
<i>North Cambridge.</i>	
Nagle, Edward G.....	1915
Olive, George M.....	1911
<i>Norwood.</i>	
Brooks, Frederick Pratt.....	1914
<i>Pittsfield.</i>	
Engstrom, Ernest Oscar, Ph.G... ..	1906
<i>Revere.</i>	
Orr, Edward Emery, Jr.....	1918
<i>Sagamore.</i>	
Adams, James Holmes.....	1906
<i>Shelburne Falls.</i>	
BAKER, EDWIN.....	1875
<i>Somerville.</i>	
Grover, George Elmer.....	1910
<i>Southbridge.</i>	
Dupaul, Armand Merrill.....	1915
<i>Springfield.</i>	
Charkoudian, Leon Nahabed....	1918
Leonard, Edward Fenno.....	1909
Lerche, Albert E.....	1913
Thompson, Clifford R.....	1916
<i>Stoneham.</i>	
Emerson, Herman Lincoln.....	1911
PATCH, EDGAR LEONARD, Ph.G..	1872
<i>Taunton.</i>	
Crossman, George A.....	1872
<i>Turners Falls.</i>	
Martel John Edward.....	1918
<i>Uxbridge.</i>	
Gunn, George Baylies.....	1917
<i>Waltham.</i>	
Gleason, Patrick Sebastian.....	1904
Hudson, John Robert.....	1910
<i>Warren.</i>	
Ruddy, Joseph Michael.....	1918
<i>Westboro.</i>	
Follensby, Edna Mildred (Miss)	1918
<i>Westfield.</i>	
Hall, Percy Newell.....	1919
<i>West Medford.</i>	
Shedd, Edwin Walter.....	1910

<i>West Roxbury.</i>	
Sumner, Jennie Henrietta (Miss), Ph.G.....	1909
<i>Winchester.</i>	
Knight, Frank Herbert, A.B., Ph.G.....	1909
<i>Winthrop.</i>	
Stover, Wm. Francis.....	1914
Winn, Howard Atkins, Ph.G....	1916
<i>Worcester.</i>	
Brewer, Howard Dickinson.....	1902
Flint, William S.....	1909
Guerin, James Francis.....	1898
MICHIGAN.	
<i>Ann Arbor.</i>	
Collins, George Wm.....	1911
EBERBACH, OTTMAR.....	1869
Glover, Clifford C.....	1913
Haarer, Oscar.....	1917
KRAEMER, HENRY.....	1892
STEVENS, ALVISO BURDETTE....	1885
Wagner, Leonard R.....	1915
<i>Battle Creek.</i>	
Goodale, Martin H.....	1910
<i>Bay City.</i>	
Bodin, Edwin T.....	1915
<i>Coldwater.</i>	
Lyon, Arthur George.....	1909
<i>Delton.</i>	
Faulkner, Ellis E.....	1917
<i>Detroit.</i>	
Allen, Wm. H.....	1914
Bertram, E. O.....	1915
Blome, Walter H.....	1915
Bradt, Frederick T.....	1915
Briggs, Clifton Henry.....	1914
Bundy, Ernest Frank.....	1919
Buzzell, Arthur L.....	1919
Bye, Mortimer.....	1916
Campbell, James Clayton.....	1919
Casey, Jas. P., M.D.....	1914
Craig, Hugh.....	1907
Crane, George W.....	1914
Doty, Wirt P.....	1914
Douglas, Mathew H.....	1914
Drugoncin, Nicholas.....	1915
Ebner, Frank Gannon.....	1918

MICHIGAN.

Edmonds, B. P.....	1917	Starwalt, Ellis Jayson.....	1915
Farwell, Oliver Atkins.....	1912	Stevens, Grant W.....	1910
Fiero, Wm. W.....	1914	Stewart, J. A.....	1915
Francis, John Miller, B.S., M.A.	1906	Taylor, Francis Owen, Ph.C....	1912
Gorenflo, Oscar William.....	1909	Thompson, Frank Augustus,	
Graber, Howard T.....	1915	Ph.C.....	1908
Grommet, Geo. H.....	1915	Van Vleet, M.....	1915
Hall, William Alanson.....	1888	<i>Vernor, James.....</i>	1866
Hamilton, Herbert C., Chemical		Washburn, Crosby B.....	1918
Engineer.....	1912	Weaver, Clarence Albert.....	1909
Hayward, Lawrence Barnes....	1912	Webster, John Hugh, Ph.G.....	1911
Hoffer, Ralph Robert.....	1917	Wheeler, Albert Alton.....	1906
Houghton, Elijah Mark, Ph.C.,		Young, Andrew Palmerston....	1914
M.D.....	1889	<i>Elk Rapids.</i>	
Ingram, Frederick Fremont, Jr..	1914	Winters, Arthur James.....	1916
Ivanoff, Petko Lazaroff.....	1913	<i>Flushing.</i>	
Jones, Ernest Ray.....	1915	Sprague, Wesson Gage.....	1895
Kimmich, Ernest.....	1914	<i>Fowler.</i>	
Kolbe, Emil B.....	1914	Moore, Maxwell S.....	1917
Lyndrup, Chris.....	1917	<i>Grand Rapids.</i>	
LYONS, ALBERT BROWN.....	1885	Hawley, Norma C.....	1916
Maguire, Edward Sylvester,		Jongejan, Cornelius Henry.....	1910
Ph.G.....	1897	Kirchgessner, William Carl,	
Mallard, Albert E.....	1907	Ph.C.....	1903
Mann, Charles Frederick.....	1903	Vellema, Peter.....	1915
Mason, Harry Beckwith.....	1896	<i>Hersey.</i>	
Mitschkun, Mark D.....	1915	Delzel, J. T.....	1915
Moyer, A. E.....	1913	<i>Highland Park.</i>	
Nelson, Edwin Horatio.....	1904	French, Adelbert P.....	1915
OHLIGER, LOUIS PHILIP.....	1871	Konzelman, Theodore.....	1919
Ohliger, Willard.....	1903	<i>Ionia.</i>	
Palmer, Gertrude M.....	1917	Gundrum, George.....	1882
Perrin, D. Edmund.....	1915	<i>Iron Mountain.</i>	
Perry, Frederick William Riley,		Seibert, George Frederick.....	1909
Ph.C.....	1885	<i>Jackson.</i>	
Pinkerton, Howard.....	1914	Thome, Edgar Reynolds.....	1918
Rohnert, Frederick.....	1915	<i>Kalamazoo.</i>	
Root, Charles T.....	1918	Light, S. Rudolph.....	1914
Rovin, Alexander M.....	1917	Todd, Albert May.....	1885
Rowe, Lewis W.....	1916	<i>Lansing.</i>	
Ryan, Frank Gibbs.....	1892	Morris, Henry.....	1919
Schaupner, John Philip.....	1915	<i>Muskegon.</i>	
Schettler, Geo. M.....	1914	Koon, Chas. S.....	1915
Scott, Frank Genio.....	1917	<i>Northville.</i>	
SCOVILLE, WILBUR LINCOLN....	1891	Langfield, Conrad Edward....	1918
Seltzer, Leonard Adams, Ph.C..	1899	<i>Saginaw.</i>	
Smailis, Joseph J.....	1919	Heim, William.....	1916
Snyder, George T.....	1917		

MICHIGAN—MINNESOTA.

<i>Sandusky.</i>		<i>Lake Park.</i>	
Hoffman, Herbert H.....	1918	Nelson, John.....	1918
MINNESOTA.		<i>Lewiston.</i>	
<i>Alexandria.</i>		Neumann, John H.....	1918
Holverson, Henry T.....	1909	<i>Lindstrom.</i>	
<i>Arlington.</i>		Elfstrand, Wilhelm.....	1905
Sharping, A. W.....	1919	<i>Little Falls.</i>	
<i>Brainerd.</i>		Johnson, Richard A.....	1918
Johnson, C. D.....	1918	<i>Mabel.</i>	
Lammon, G. E.....	1918	Jones, Dillwyn W.....	1918
<i>Canton.</i>		<i>Mankato.</i>	
Case, Westwood D.....	1919	Steiner, Frank A.....	1918
<i>Chisholm.</i>		<i>Milroy.</i>	
Casey, Edmund L.....	1918	Taplin, Clifford Florian.....	1918
<i>Detroit.</i>		<i>Minneapolis.</i>	
MacGregor, Charles.....	1916	Allen, E. Floyd.....	1885
<i>Duluth.</i>		Bachman, Gustav.....	1905
Abbett, William Allen.....	1901	Bercowitch, Jack D.....	1917
<i>East Grand Forks.</i>		Butters, Charles Hayes.....	1907
Kingman, Ignatius.....	1917	Danek, John Francis.....	1895
<i>Eden Valley.</i>		Dooley, Daniel B.....	1918
Scott, John Herman.....	1918	Erkel, Arthur George, Ph.C....	1910
<i>Fergus Falls.</i>		Gamble, Stewart.....	1897
Beise, John Henry.....	1908	Goldner, John E.....	1918
Johnson, John T.....	1918	Greenberg, Earl N.....	1918
<i>Fertile.</i>		Griffen, Truman.....	1909
Demars, Gustave Jules.....	1918	Hartwell, Geo. Henry.....	1914
<i>Fulda.</i>		Huhn, Charles Hugo, Ph.C....	1905
Johnson, M. G.....	1917	Karnofsky, Charles F.....	1918
<i>Gilbert.</i>		King, George Alexander Newton	1892
Dukelow, Richard T.....	1918	Kline, A. J.....	1918
<i>Glenwood.</i>		Kusterman, Fred G.....	1918
Krueger, E. E.....	1919	Mulrean, Anna A.....	1918
<i>Good Thunder.</i>		Netz, Charles Vail.....	1919
Sequist, Oscar William.....	1918	Newcomb, Edwin Leigh, P.D....	1906
<i>Granite Falls.</i>		O'Connell, Margaret.....	1919
Koefod, Lanwitz N.....	1918	Robitshek, Irving H.....	1914
<i>Grygla.</i>		Rogers, Charles Herbert.....	1914
Clay, Andrew W.....	1918	Strimling, Abraham.....	1919
<i>Hariland.</i>		Strimling, Wm.....	1919
Rotegard, Bernard C.....	1918	Stuart, Josephine A. Wanous,	
<i>Hill City.</i>		(Mrs.).....	1897
Schoen, R. (Mrs.).....	1918	Sweet, William Herbert.....	1905
<i>Hopkins.</i>		Turner, Del Delos.....	1918
Smetana, William S.....	1915	Wulling, Frederick John, Ph.G.,	
<i>Janesville.</i>		L.L.B.....	1893
Hirscher, Alfred Meade.....	1918	<i>Montevideo.</i>	
		Arneson, Theodore A.....	1918

MINNESOTA—MISSISSIPPI—MISSOURI.

<i>Ogilvie.</i>		<i>Welcome.</i>	
Conger, Horace Samuel.....	1918	Mamer, Bernard.....	1918
<i>Ortonsville.</i>		<i>Wibbing.</i>	
Nielson, John.....	1897	Stein, Milton.....	1918
<i>Osakis.</i>		<i>Winona.</i>	
Blomquist, Arthur.....	1919	Brown, Edwin A.....	1918
Haywood, George H.....	1919	<i>Worthington.</i>	
<i>Pine City.</i>		Morland, Robert Lawson.....	1909
Breckenridge, John Y., Jr.....	1915	Miner, Herbert L.....	1918
<i>Pipestone.</i>		MISSISSIPPI.	
Menzel, Max.....	1915	<i>Aberdeen, Monroe Co.</i>	
<i>Red Lake Falls.</i>		Eckford, Joseph William.....	1883
Schreiter, Norman Carl.....	1918	<i>Flora.</i>	
<i>Red Wing.</i>		Anding, C. E.....	1914
Claydon, P. H.....	1918	<i>Gulfport.</i>	
Sylvander, Nels J.....	1918	Lewis, Robert Henry, Jr.....	1918
<i>Rochester.</i>		<i>Hattiesburg.</i>	
Hoffman, Edward L.....	1918	Shirley, James M.....	1918
Judd, Cornelius M.....	1918	<i>Jackson.</i>	
<i>St. Paul.</i>		Hall, Edward J.....	1918
Aberwald, Louis James.....	1918	<i>McComb.</i>	
Bollinger, Clifford H.....	1912	Beard, John A.....	1918
Collier, William Kelley.....	1892	<i>Meridian.</i>	
Conger, Frederick Albert.....	1907	Kendall, Gus C.....	1913
Frost, William Arthur, Ph.G. . .	1892	<i>Philadelphia.</i>	
Heller, Chas. T.....	1906	Stribbling, J. H.....	1917
Jelinek, John Peter.....	1907	<i>Poplarville.</i>	
Johnson, Hans Martin.....	1915	Smith, Fred W.....	1919
McCall, Henry.....	1910	<i>Port Gibson.</i>	
Messing, Richard J.....	1913	SHREVE, JOHN ALEXANDER.....	1880
Noyes, Charles Reinold, B.A. . .	1908	<i>Tylertown.</i>	
Parker, Frederick M.....	1902	Pigott, Charles Dewitt.....	1917
Rietzke, Herman W.....	1909	<i>University.</i>	
Smith, Frederick Alfred Upsher,		Faser, Henry Minor.....	1910
Ph.C.....	1907	Swan, John Nesbit.....	1918
Strate, Herbert A.....	1917	<i>Vicksburg.</i>	
Zutz, Henry Emil.....	1918	Heckler, Michael Schuster.....	1918
<i>Stillwater.</i>		MISSOURI.	
King, Ira Perkins.....	1919	<i>Boonville.</i>	
<i>St. Cloud.</i>		Mittelbach, William, Ph.G.....	1891
Molitor, Martin.....	1918	<i>Brunswick.</i>	
<i>Thief River Falls.</i>		Bowen, Cyrus West, B.S., M.S.,	
Bryant, David K.....	1918	M.D., Ph.G.....	1912
<i>Tyler.</i>		<i>Cape Girardeau.</i>	
Vodheim, Joseph.....	1917	Miller, Edwin Alexander, B.Pd.,	
<i>Wadena.</i>		Ph.G.....	1912
Anderson, John Gustav.....	1918	Miller, Isaiah Benjamin.....	1912

MISSOURI.

<i>East Prairie.</i>			Gietner, Charles, Ph.G.....	1905
Doyle, Robert A.....	1914		GOOD, JAMES MICHENER.....	1871
Hawkins, John M.....	1915		Grewe, Louis Frederick, Ph.G...	1901
<i>Excelsior Springs.</i>			Hagenow, Theodore Chas.....	1915
Tindall, Henry Clay.....	1918		Hahn, Charles Wm. John Henry	1901
<i>Hannibal.</i>			Hammett, Frank U.....	1914
Davis, John T., Jr.....	1918		HEMM, FRANCIS.....	1881
<i>Kansas City.</i>			Ilhardt, William Kelerman.....	1901
Amos, Wilbur Stanton.....	1908		Koch, Albert H.....	1914
Federmann, William Martin...	1901		Kring, Gustave.....	1912
Fuller, James Cook.....	1918		Kurtz, Irwin William.....	1904
Graham, Charles E.....	1918		Lambert, Alert Bond.....	1914
Hess, Paul Ludwig.....	1892		Lehmann, Louis John.....	1911
Linck, Truman A.....	1916		Lieberstein, Jacob.....	1913
Whitney, David Victory, Ph.G.	1903		Lieberstein, Louis, Ph.G.....	1909
Whitney, Minnie M. (Mrs.)....	1914		MALLINCKRODT, EDWARD.....	1869
Wirthman, John George.....	1903		Martin, Albert J.....	1918
Wirthman, Joseph Charles.....	1903		Merner, Garfield David.....	1918
Zinn, Charles Edward.....	1909		Merrell, George Robert.....	1901
<i>Kirksville.</i>			Merrell, Hubert Spencer, Jr.,	
Stookey, H. Frank.....	1914		Ph.B., Ph.C.....	1910
<i>Malden.</i>			Meyer, Carl F. G.....	1918
Metzger, Arthur S., Ph.G., Ph.C.	1908		Noble, J. Merner.....	1917
<i>Mexico, Adrian Co.</i>			Pauley, Alfred Washington....	1914
Llewellyn, Henry Duncan.....	1915		PAULEY, FRANK CHARLES.....	1879
<i>Nevada.</i>			Prichard, Leslie Elridge.....	1918
Ballagh, Wilfred Thomas.....	1901		Ruf, Frank A.....	1913
<i>New Madrid.</i>			Salb, Oscar G.....	1915
Hummel, John Andrew.....	1901		Schlueter, Robert Ernst., Ph.G.,	
<i>St. Joseph.</i>			M.D.....	1904
Rudolph, Bertha (Mrs.).....	1919		Schoenthaler, John Paul.....	1901
<i>St. Louis.</i>			Seitz, Lorenz Aloysius.....	1901
Ambler, Jessie H.....	1914		Sennewald, Emil August.....	1900
Barnstead, Sidney Ormon.....	1917		Smith, Paul W.....	1912
Batdorf, Lydia Franke.....	1915		Speckart, Otto Norbert.....	1914
Berg, Frantz F., Ph.G.....	1914		Sternfels, Urvan Ruiz.....	1918
Blakeslee, Louis George.....	1903		Stolle, Henry Jasper.....	1903
BOEHM, SOLOMON.....	1871		Stuart, Francis Joseph.....	1913
Brewer, Justin Sewall.....	1912		Sultan, Frederick William.....	1901
Buckland, Thomas A.....	1914		Suppan, Leo Richard August...	1904
Burkart, George Adrian.....	1915		UHLICH, FERDINAND GOTTLIEB..	1881
Caspari, Charles Edward.....	1902		Veillon, Lewis, M.D.....	1915
Claus, Otto Ferdinand, M.D....	1901		Wallbridge, Cyrus Packard....	1901
Coussens, Bettie Prince (Miss)..	1910		Wall, Otto Augustus.....	1884
Emery, Charles Wm., Jr.....	1914		Welsh, Joseph Bruner.....	1910
Falk, John Charles, Ph.G., M.D.	1900		WHELPLEY, HENRY MILTON,	
Florian, Alvin Geo.....	1918		Ph.G., M.D.....	1887
Fricke, Frederick Henry.....	1901		Wilkerson, Jerome Aloysius....	1911

MISSOURI—MONTANA—NEBRASKA.

Williams, N. Emery, Ph.G.....	1912
Wolff, Edward Henry.....	1901
<i>Sedalia.</i>	
Bard, William E.....	1901
SMITH, OTIS WILMER.....	1903
<i>Springfield.</i>	
Trantham, Isham A.....	1914
<i>Webster Grove, St. Louis Co.</i>	
Garvin, William S.....	1917
Mueller, Ambrose.....	1894
<i>Windsor, Henry Co.</i>	
Wesner, Henry Clay.....	1901

MONTANA.

<i>Absarokee.</i>	
Erb, Olin.....	1917
<i>Belgrade.</i>	
Porter, W. P.....	1915
<i>Billings.</i>	
Chapple, Charles J.....	1915
<i>Boseman.</i>	
Kraker, John Lewis.....	1912
<i>Butte.</i>	
Montgomery, W. R.....	1915
Rockefeller, Howard.....	1900
<i>Conrad.</i>	
Heden, Myrtle M.....	1918
<i>Great Falls.</i>	
Lapeyre, Ben. E., Jr.....	1916
Woehner, Frederick A.....	1909
<i>Helena.</i>	
Ritter, Walter A.....	1918
Starz, Emil.....	1916
<i>Livingston.</i>	
Scheuber, Frank Augustus.....	1905
<i>Missoula.</i>	
Bateman, Herbert Howard.....	1909
Carmichael, John D.....	1918
Coffee, Sidney J.....	1909
Mollett, Charles Edwin Francis,	
Ph.C.....	1909
Peterson, Alex. F.....	1914
<i>Sheridan.</i>	
Walter, Adeline.....	1918

NEBRASKA.

<i>Arlington.</i>	
Weber, Don Caesar.....	1908

<i>Atkinson.</i>	
Schultz, William Ludwig.....	1915
<i>Auburn.</i>	
Dort, Edward Harvey.....	1903
<i>Creston.</i>	
Ewing, Samuel E.....	1913
<i>Edgar.</i>	
Brookley, Will.....	1915
<i>Fairbury.</i>	
Pease, Autumn Vine.....	1893
<i>Holbrook.</i>	
Butler, Guy.....	1909
<i>Holdredge.</i>	
Fink, Daniel Jacob.....	1903
<i>Kenesaw.</i>	
Mikkelsen, Niels.....	1903
<i>Lincoln.</i>	
Day, Elsie.....	1915
Haschenburger, Edmund Ommen,	
Ph.G.....	1907
Lyman, Rufus Ashley, A.B.,	
A.M., M.D.....	1908
Meier, Rudolph L.....	1916
Thompson, Harry Landis.....	1917
<i>McCook.</i>	
McConnell, Lewis William, Ph.G.	1904
<i>Oconto.</i>	
Jones, Orel, Ph.G.....	1911
<i>Omaha.</i>	
Cermak, Emil.....	1908
Gerald, Herbert Franklin, M.D.	1906
GERING, HENRY R.....	1907
Green, James Harvey.....	1912
Johnson, Leland A.....	1916
McConnell, Andrew B.....	1915
McEwen, Irving.....	1914
Newton, Howard Chamberlain..	1912
Piel, Warner A.....	1912
Schuhl, Albert L.....	1918
Sherman, Charles Rollin.....	1889
<i>Ord.</i>	
Beranek, Edward Frank.....	1915
<i>Overton.</i>	
Hoye, Daniel J.....	1911
<i>Plattsmouth.</i>	
Fricke, Frederick George.....	1903
Mauzy, James G.....	1915

NEBRASKA—NEVADA—NEW HAMPSHIRE—NEW JERSEY.

<i>Shelby.</i>		<i>Collingswood.</i>	
Thelen, Karl M.....	1915	Barrett, Charles Llewellyn.....	1902
NEVADA.		Sturmer, Julius William, Ph.G.,	
<i>Elko.</i>		Phar.D.....	1901
Englert, William Robert.....	1915	Vanderkleed, Charles Edwin....	1902
<i>Reno.</i>		<i>Cranford.</i>	
Taber, Joseph Mark.....	1912	Goeckel, Henry Jos.....	1918
<i>Tonopah.</i>		<i>Dover.</i>	
Piercy, Joseph C.....	1918	Meuser, Louis J.....	1916
NEW HAMPSHIRE.		<i>East Orange.</i>	
<i>Berlin.</i>		Dahl, Fred.....	1913
Arnold, Henry C. F.....	1918	Mansfield, Wm.....	1907
<i>Groveton.</i>		<i>Elizabeth.</i>	
Elliott, Fay Harold.....	1916	Jacobson, Samuel M.....	1915
<i>Manchester.</i>		Langheinz, Louis P.....	1915
Knowlton, George Harry.....	1907	OLIVER, WILLIAM MURRAY.....	1875
<i>Portsmouth.</i>		Schmidt, Henry.....	1904
Grace, William Day.....	1896	Stutzlen, Frank Charles.....	1902
Green, Benjamin.....	1888	Thum, George Ernest.....	1915
<i>Rochester.</i>		Tyler, Earl Albert.....	1916
Twombly, A. P.....	1918	<i>Fort Hancock.</i>	
NEW JERSEY.		Hahn, Gustave, Sgt. 1st Cl.	
<i>Atlantic City.</i>		H. C., U. S. A.....	1912
Crawford, Dean Burton.....	1916	<i>Freehold.</i>	
<i>Bayonne.</i>		Givens, Ed. M.....	1918
Dodge, Francis Despard.....	1910	<i>Frenchtown.</i>	
Reiser, Philip.....	1913	Harman, Harry M., M.D.....	1909
<i>Bogota.</i>		<i>Hackensack.</i>	
Fried, Leopold H.....	1914	Steiger, Leonard.....	1918
<i>Bridgeton.</i>		<i>Haddonfield.</i>	
Jorden, Henry Albert, Ph.G....	1902	King, James David.....	1910
Whipple, Oscar Kellog.....	1916	<i>Hillsdale.</i>	
<i>Burlington.</i>		Nielsen, Paul Edward.....	1919
Hires, Lewis Moore.....	1916	<i>Hillside.</i>	
Koelble, Carl Robert.....	1919	Potter, James S.....	1916
Sparks, Edgar Reed, Ph.G....	1909	<i>Jersey City.</i>	
<i>Camden.</i>		FOULKE, JAMES.....	1881
Beringer, George Mahlon.....	1893	Hines, Luke Carleton, Ph.D....	1915
Beringer, George Mahlon, Jr.,		McCloskey, Charles J.....	1916
P.D.....	1905	Mitschele, Albert H.....	1915
Herting, A. C.....	1918	Owens, William H.....	1916
Weiser, William Pfeiffer.....	1902	Patella, Carmela.....	1918
<i>Carney's Point.</i>		Pinter, Edmund D.....	1918
Mosher, Donovan D.....	1918	Richardson, Gerald Arthur.....	1918
<i>Clifton.</i>		<i>Jersey City Heights.</i>	
Takamine, Jokichi.....	1898	Bongartz, Ferdinand Alphonse..	1905
		<i>Kearney.</i>	
		Shaak, Franklin Philip.....	1906

NEW JERSEY.

<i>Keyport.</i>	
Warn, William Edgar.....	1886
<i>Lakewood.</i>	
Taylor, Leon A.....	1916
<i>Linden.</i>	
Kraemer, William Charles.....	1914
<i>Maplewood.</i>	
Byrnes, Garrett.....	1913
Geimer, Frederick M.....	1916
<i>Medford.</i>	
THORN, HENRY PRICKETT, Ph.G.	1879
<i>Milburn.</i>	
Campbell, George Stelle.....	1914
Fruchtman, Samuel R.....	1918
<i>Montclair.</i>	
Stein, Edward Theodore North.	1916
Wensch, Henry Ernst, Jr., Ph.G.	1902
<i>Morristown.</i>	
CARRELL, EUGENE AYERS.....	1875
Smith, Henry M.....	1918
<i>Mount Holly.</i>	
Jones, Edward B.....	1909
<i>Newark.</i>	
Bear, Pierce B.....	1905
Crooks, Harry W.....	1915
Disbrow, William Stephen, M.D.	1915
Foster, John Benjamin.....	1901
Goodman, Samuel Morris.....	1918
Holzhauser, Charles William.....	1907
Maltbie, Birdsey Lucius.....	1912
Marquier, Adolph F., Ph.G.....	1909
Menk, Charles William.....	1898
Quin, Harry J.....	1918
Ritchie, Margaret (Miss).....	1919
Rusby, Henry Hurd.....	1890
SAYRE, EDWARD AUGUSTUS.....	1877
Scholz, Oscar Robert Bruno.....	1909
Seidler, Alexander.....	1916
Staehle, Louis L.....	1916
Wickham, Edward A.....	1919
<i>New Brunswick.</i>	
Anderson, John.....	1918
KILMER, FREDERICK BARNETT...	1886
<i>Nutley.</i>	
Seeley, Milton J.....	1914
<i>Ocean Grove.</i>	
Woolley, Stephen Disbrow.....	1915

<i>Orange.</i>	
Behrens, John Frederick.....	1908
<i>Paterson.</i>	
Lamar, Wm. Robinson.....	1901
McNeill, William Henry.....	1912
<i>Perth Amboy.</i>	
Parisen, George Warren.....	1892
<i>Point Pleasant.</i>	
Johnson, Albert Burtis.....	1916
<i>Rahway.</i>	
Murray, Benjamin Linley, Ph.C., B.S., A.M.....	1896
Verneau, Edward J.....	1916
<i>Red Bank.</i>	
Van Derveer, Robert Hutchinson	1903
<i>Rutherford.</i>	
Stocking, Charles Howard.....	1914
<i>South Orange.</i>	
Feindt, Louis E.....	1906
<i>Springfield.</i>	
Rutkins, Chas. Paul.....	1918
<i>Spring Lake Beach.</i>	
Hills, Daniel Henry.....	1918
<i>Tenafly.</i>	
Bower, Edwin Lawrence.....	1909
<i>Trenton.</i>	
Randolph, Raymond Bernard Fitz.....	1912
<i>Union Hill.</i>	
Bischoff, H. E.....	1915
<i>Verona, Essex Co.</i>	
Rich, William Pitt.....	1902
<i>Vineland.</i>	
Lowe, Clement Belton, Ph.B., Ph.G., M.D.....	1895
<i>Weehawken.</i>	
Frank, August, Ph.G.....	1912
<i>West Hoboken.</i>	
Maggio, James Innocenzo.....	1907
Neu, Daniel Alfred.....	1903
Sieker, Ferdinand August.....	1893
Suhr, Louise Seline.....	1916
<i>Westfield.</i>	
Frutchey, George Watson.....	1909
<i>Woodstown.</i>	
Andrews, George M.....	1913
Mead, Harold Barr.....	1910

NEW MEXICO—NEW YORK.

NEW MEXICO.

Albuquerque.

Ruppe, Bernard Charles..... 1908

East Las Vegas.

Murphey, E. G..... 1909

Las Cruces.

Dyne, Bert George..... 1915

Socorro.

Hilton, Emily K. (Mrs.)..... 1913

NEW YORK.

Albany.

BRADT, WARREN LANSING..... 1903

Dillenback, Garrett Van der Veer 1902

Lange, Wm. Maurice..... 1914

Michaelis, Gustavus, Ph.G..... 1882

Ostrander, Clarence Edward... 1916

Auburn.

Adams, Arthur Ellison..... 1902

Sears, Charles Barager..... 1906

Bound Brook.

Cardarelli, Eugene James..... 1916

Bronx.

Adoff, Morris..... 1918

Bankoff, Jacob..... 1915

Frank, Henry..... 1918

Friedman, Louis..... 1918

Hager, Max M..... 1918

Matlin, Abraham..... 1918

Nagin, Eugene..... 1918

Petretti, Oreste..... 1918

Ria-Coy, Naftul-Herz..... 1918

Taylor, Wm..... 1914

Weinstock, Sidney..... 1918

Zagat, Mendel..... 1918

Brooklyn.

Ajello, Anthony L..... 1918

Anderson, William Christine,

Ph.G., Phar.D..... 1900

Bartlett, Kenneth A..... 1919

Beach, DeMott Clark..... 1915

Benton, William Mayze..... 1919

Cook, Harry Warren..... 1918

Creagan, William Thomas..... 1912

DeJonge, Cornelius..... 1899

Dewender, William Henry..... 1896

Diehl, August..... 1909

Dissoaway, Thurston N., Ph.C... 1905

Duerr, George John..... 1911

Dunn, Mrs. John A..... 1919

Eccles, Robert Gibson, M.D.... 1885

Feller, Leo..... 1916

Fischer, Charles F..... 1919

FOUGERA, EDMUND CHARLES

HENRY..... 1890

France, Thos. J..... 1917

Gardner, Alexander, Ph.G..... 1910

Giorgianni, Salvatore..... 1918

Guerra, Alirio Diaz, M.D..... 1916

Haase, William Frederick, Jr... 1918

Hager, Max M..... 1919

Hall, George Chalmers..... 1914

Hapke, Paul..... 1918

Heimezheim, Eugene..... 1914

Hereth, Frank Samuel..... 1893

Jackson, William R..... 1918

Kissick, Robert George..... 1917

Krumwiede, Howard Andrew... 1919

Liebman, Samuel..... 1918

Lohness, Archie Percival..... 1913

Maines, Eugene L..... 1912

Mangan, Daniel C..... 1918

Marianowsky, Jacob..... 1915

McELHENIE, THOMAS DEAR-

MOND, Ph.G..... 1872

Means, Earl A..... 1918

Miller, David..... 1918

Neninger, Fred Martin..... 1915

Nitardy, Ferdinand Wilhelm,

Ph.G., Ph.C..... 1905

Ocheret, Rebecca (Miss)..... 1918

Pakchar, Julius M..... 1918

Planton, H. Rolf..... 1916

Rabinowitz, Harry..... 1918

Raubenheimer, Otto, Ph.G..... 1902

Rehfuss, Jacob H..... 1913

Roon, Leo..... 1913

Rosenzweig, Benjamin..... 1898

Schaefer, Frederick..... 1916

Schwartz, Israel..... 1914

Shavel, Charles..... 1918

Silverman, Abraham..... 1918

Snyder, Ambrose Chancellor.... 1867

Sticht, Gustave Alfred..... 1916

Tehner, Guy Oram..... 1918

Turner, Joseph L..... 1914

NEW YORK.

Tuthill, Frederick Percival, Ph.G., Phar.D.....	1899	<i>Elmira.</i> HOLMES, CLAYTON WOOD.....	1873
Westheimer, David	1912	<i>Flushing.</i> HEPBURN, JOHN.....	1873
Weygandt, Wm. H.....	1918	<i>Fort Slocum.</i> Baum, Fred C.....	1911
Wierzicki, Stephen.....	1919	<i>Hudson.</i> Wardle, Arthur Stanley	1910
Wyckoff, Elmer Ellsworth.....	1906	<i>Jamaica, L. I.</i> Gidley, William Francis, Ph.C., B.S.....	1910
<i>Buffalo.</i> Bentz, Florence Louise.....	1917	<i>Kingston.</i> Dedrick, William Frederick.....	1914
Bentz, Henry George.....	1904	McBride, Charles Luther.....	1910
Booth, Clarence Frederick.....	1916	<i>Little Falls.</i> Hurley, John.....	1909
Dimond, Harry John.....	1904	<i>Long Island.</i> Michaels, George L.....	1917
Elden, Clarence Arthur.....	1918	Morgan, William F., Phar.D....	1917
Fish, Erwin L.....	1918	<i>Lyons.</i> Noble, Clifford Arthur.....	1918
Gregory, Willis George, M.D., Ph.G.....	1886	<i>Manhattan.</i> Beilstein, Christian.....	1907
Handy, John Abner.....	1914	<i>Martinsville.</i> Helwig, Raymond G.....	1918
HAYES, HORACE PHILLIPS.....	1880	<i>Middletown.</i> Rogers, Fred Schwartz.....	1914
Keller, Andrew John.....	1918	ROGERS, WILLIAM HENRY.....	1869
Koch, Edward Wm.....	1918	<i>Mount Vernon.</i> Horstmann, Gustave, Ph.D.....	1914
Lock, Frank E.....	1910	<i>New Lebanon.</i> Cox, J. Harry.....	1914
Lockie, Peter M.....	1911	<i>New York.</i> Adler, Arthur.....	1917
Menzies, John William.....	1911	Albrecht, Albert.....	1918
Morgan, Richard Franklin.....	1914	Allison, William O.....	1895
Reimann, George.....	1902	Altman, Jos.....	1914
Stearns, William Lincoln, Ph.G..	1903	Armentano, Anthony.....	1918
<i>Cairo.</i> Austin, Richard A.....	1916	ARNY, HARRY V., Ph.G., Ph.D..	1891
<i>Cambridge.</i> Richardson, Frank, Ph.G.....	1906	Ballard, Charles William, Ph.C., Phar.D., M.A.....	1908
<i>Catskill.</i> DuBois, WILLIAM LANEMAN....	1880	BALSAR, GUSTAVUS.....	1875
<i>College Point.</i> Klein, Edward Nicholas Emil, Ph.C.....	1905	Berger, Louis, Ph.G.....	1907
<i>Concord, S. I.</i> Nolan, Joseph John.....	1916	Bergman, Max.....	1918
<i>Corning.</i> COLE, VICTOR LE ROY.....	1880	Berniker, Isaac.....	1918
<i>Crotona Park East.</i> Edelstein, Irving A.....	1918	Bernstein, Chanon.....	1916
<i>Dannemora.</i> Sloss, Robert Audley.....	1901	Bigelow, Clarence Otis.....	1900
<i>Dunkirk.</i> Davis, Eugene Miller.....	1892	Bilhuber, Ernst.....	1912
<i>Ellis Island.</i> Rogers, Edward.....	1902		
<i>Elmhurst, L. I.</i> Goodman, Joseph.....	1916		

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Billig, Benjamin.....	1918	Geisler, Joseph Frank.....	1889
Black, Franklin.....	1916	Ginliani, Anthony.....	1918
Blomeier, Herman Henry.....	1915	Ginsberg, Julius.....	1917
Blumenkrantz, Isidore Jacob....	1916	Githens, Thomas Stotesbury....	1909
Breitenbach, Max J.....	1916	Goldberg, Philip.....	1918
Breivogel, Philip J.....	1916	Goldwag, Joseph Samuel.....	1918
Brickelmaier, Paul H.....	1913	Greenberg, Joseph.....	1918
Brisson, Alfred Frederick.....	1918	Hamann, William Augustus....	1907
Brown, Lewis Nathan.....	1916	Hansburg, Max.....	1916
Bush, Burton T.....	1916	Harper, Grace Irene.....	1918
Canis, Otto F. A.....	1918	Harris, Harry L.....	1913
Cecalello, James.....	1918	Hart, Fanchon.....	1917
CHANDLER, CHARLES FREDERICK	1867	Hatcher, Robert Anthony.....	1905
Chapman, Chas. J.....	1918	HAYNES, DAVID OLIPHANT.....	1887
Cheatham, Wm. B.....	1917	Heimovitch, Max.....	1918
Chronik, Edward F.....	1916	Henning, Adolph.....	1905
Coblentz, Virgil.....	1882	Herzog, Carl J.....	1918
Cohen, Joseph.....	1918	Hohmann, George.....	1910
Cone, Alfred I.....	1905	Holcomb, Willis Cobb.....	1918
Costelo, David.....	1915	Holliday, Francis Emlen.....	1900
Currens, Turner Fee.....	1914	Hopkins, Jesse L.....	1898
Daggett, Volvey Chapin.....	1901	Hostmann, Jeannot.....	1912
Deffa, George Caspar.....	1918	Hubbard, Winfield Scott, Ph.G., B.S., M.A., Ph.D.,.....	1912
Diekman, Clara Ada (Mrs.)....	1912	Hurwitz, Eliaku S.....	1918
Diekman, George Charles.....	1898	Israel, Boris S.....	1918
Dill, Charles Thomas.....	1917	Israel, David.....	1918
Dillemoth, Frederick G., M.D....	1916	Jacobsohn, Joseph.....	1915
Diner, Jacob, Ph.G.....	1906	Jones, James H.....	1915
Douglass, Brandegge, H. S., U. S. N.....	1916	Kalish, Oscar G., Ph.G.....	1900
Dreyer, John D.....	1917	Kantrowitz, Hugo.....	1907
Dunbar, Eugene A.....	1916	Katz, Eugene.....	1918
Eichler, Philip, M.D.....	1916	KENNEDY, EZRA JOSEPH.....	1887
Eolis, Bernard.....	1918	Kerr, Joseph Robert.....	1918
Erhart, William Hermann.....	1907	Kerr, Julius.....	1918
FAIRCHILD, BENJAMIN THOMAS..	1875	Kerr, Nathan.....	1918
Fairchild, Samuel William.....	1887	Ketcham, Sylvius.....	1916
Feldman, Jacob.....	1917	Kirchgasser, Wm. Charles, Ph.G.	1888
Fiarilla, Julius.....	1918	Klingmann, Albert.....	1910
Fitzsimmons, Geo. E.....	1917	Koch, Anthony Philip.....	1918
Fleishman, Israel.....	1918	Koch, William Julius.....	1907
Fox, Edward.....	1916	Kornfield, Alexander.....	1918
Frankfurter, F. S.....	1916	Kuhe, Bruno Kandars.....	1918
FRASER, HORATIO NELSON, Ph.G., Ph.M., M.D.....	1888	LaMonte, Frank Vincent.....	1918
French, Leon Hermann.....	1917	Lampa, Robert Raymond.....	1892
Friedgen, Charles.....	1915	Lascoff, Jacob Leon.....	1903
Gane, Eustace Harold.....	1895	Lehman, Robert Seel.....	1917
		Leslie, Frederick Arthur.....	1916

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Levy, Louis Spencer.....	1916	Roediger, Louis Frank, Ph.G....	1909
Lifshitz, Jacob.....	1918	Roller, Emil, Ph.G.....	1916
LoPorto, Edward E.....	1916	RUNYON, EDWARD WHEELOCK...	1875
Lore, John D.....	1918	Rupert, Jonas F.....	1913
Loring, Charles A.....	1917	Sahm, Louis Napoleon.....	1905
Loud, Theodore Richard L.....	1917	Samsonoff, Joseph.....	1918
Lovis, Henry Christian.....	1892	Saphiro, Isadora.....	1914
Luft, George W.....	1913	Schaefer, Hugo.....	1916
Lurie, James.....	1914	Schieffelin, William Jay, M.D....	1892
Mace, John Edward.....	1916	Schimpf, Henry William.....	1894
Maisel, Joseph... ..	1908	Schlicke, Carl Paul.....	1913
Major, Alphonse.....	1913	Schnell, Harry Julius.....	1906
Mantell, David R.....	1919	Schneller, J. Max A.....	1918
Marchonski, Samaron.....	1918	Schweinfurth, George Edward...	1907
Matlin, Max.....	1918	Scott, Harry.....	1907
Mayer, Joseph L.....	1905	Shapiro, Joseph.....	1918
Mayo, Caswell Armstrong.....	1893	Sharkansky, Eugene Louis.....	1918
McCartney, Frank Leslie, Phar.D.....	1907	Shattuck, H. B.....	1918
McINTYRE, EWEN, JR.....	1903	Sher, Edward.....	1911
McKesson, Donald, B.A.....	1906	Shnitter, Adolf, Ph.G.....	1914
McKesson, George Clinton.....	1888	Silkes, Charles.....	1918
McKESSON, JOHN, JR.....	1867	Simon, George.....	1916
Metz, Herman A.....	1910	Smith, Carl Edw.....	1911
Miller, Bernard.....	1918	Solomon, Abraham.....	1918
Moonves, Jacob B.....	1918	Sorowitz, Harry M.....	1919
Mozieleff, Samuel.....	1918	Soskin, Max.....	1919
Mullen, Albert E.....	1918	Sparhawk, Charles V.....	1916
Nevin, Thomas.....	1912	Spring, George Alexander.....	1907
Noonan, Harry.....	1916	Starr, Frank C.....	1917
Oats, Charles A.....	1917	Starr, Mabel Charlotte.....	1916
O'Kane, Eugene Tracy.....	1918	Stauffen, Ernst.....	1916
O'NEIL, HENRY MAURICE.....	1879	Stein, Samuel.....	1918
Parker, William Frank.....	1918	Steinach, Edwin C.....	1919
Partos, N. C.....	1916	Sterling, Montagu M.....	1918
Pase, Homer S.....	1916	Stone, Clarence George, Ph.C....	1901
Pedroni, Lawrence E.....	1918	Susslin, Charles A.....	1918
Pegg, George W.....	1918	Timmermann, Richard Herman..	1909
Penick, S. Barksdale.....	1914	Tobias, Morris.....	1915
Pfeiffer, Gustavus Adolphus....	1910	Tocco, Orazio.....	1910
Pierson, Romaine.....	1913	Tompkins, George R.....	1916
Plaut, Edward.....	1916	Tucker, Thomas H.....	1912
Podolsky, Reuben.....	1915	Tufts, Archie L.....	1918
Pursell, Robert C.....	1916	Ungerer, Wm. Geo.....	1918
Quackenbush, Benjamin Frank- lin.....	1886	Vaccarino, Joseph Anthony.....	1918
Riefflin, George T.....	1909	Velsor, Joseph A.....	1913
Rippetoe, John Ross, P.D.....	1907	Villamena, Diadato.....	1918
		Walter, Herman.....	1916
		Warren, Lewis Eugene.....	1909

NEW YORK—NORTH CAROLINA.

Wasserscheid, August A.....	1916
Weil, Jacob.....	1913
Weiss, Emil Otto.....	1907
WICKHAM, WILLIAM HULL.....	1870
Williams, John M.....	1918
Williamson, Harry Hays, H. S., U. S. N.....	1916
Wimmer, Curt Paul.....	1907
Wirth, Rudolph.....	1917
Yates, Franklin B.....	1916
Zink, Edward.....	1916
Zufall, C. J.....	1919
<i>Norwich.</i>	
McNulty, William Peter.....	1916
Snyder, John Paul.....	1915
Stofer, Richard Calvin.....	1914
Windolph, J. Fred.....	1913
<i>Poughkeepsie.</i>	
Driscoll, Thomas J.....	1916
<i>Richmond Hill, L. I.</i>	
Stephenson, John Joseph, Ph.G.	1905
<i>Rochester.</i>	
Chilson, Elmer E.....	1916
Hyde, Byron M.....	1908
Olmstead, David M., Ph.C.....	1916
Smith, J. Hungerford.....	1913
<i>Roslyn Heights, L. I.</i>	
Meyer, Samuel.....	1914
<i>Salamanca.</i>	
Krieger, John Christian.....	1908
<i>Saratoga Springs.</i>	
FISH, CHARLES FREDERICK.....	1866
Louis, Cramer.....	1914
<i>Sayville.</i>	
Thornhill, Sewell.....	1909
<i>Sheepshead Bay.</i>	
McMahon, Joseph.....	1897
<i>Springfield, L. I.</i>	
De Forest, William Pendleton.....	1879
<i>Stapleton, S. I.</i>	
Kinsey, Raymond Daniel.....	1917
<i>Staten Island.</i>	
Kuller, Mrs. G. P.....	1913
<i>Syracuse.</i>	
Cummings, Wm. Leon.....	1914
DAWSON, EDWARD SEYMOUR, JR.	1876
Muench, Albert August.....	1914
Muench, William.....	1899

SNOW, CHARLES WESLEY.....	1876
<i>Tompkinsville.</i>	
Reige, Flower H.....	1918
<i>Tottenville.</i>	
Lehman, Charles Norton.....	1909
<i>Tupper Lake.</i>	
Monakey, Leon C.....	1918
<i>Utica.</i>	
Paolantonio, John.....	1918
Watson, William, Jr.....	1902
<i>Westhampton.</i>	
Raynor, W. Clifford.....	1918
<i>West New Brighton, S. I.</i>	
Lord, Leon S.....	1916
<i>White Plains.</i>	
Davis, Mrs. May Agnes.....	1917
<i>Woodhaven, L. I.</i>	
Andrews, Lionel T.....	1918
Garvey, James Aloysius, P.D....	1909
Zeluff, Irwin Simpson.....	1915
<i>Yonkers.</i>	
Klatz, Boruch.....	1918
Petsche, Franz Friedrich Bis-	
marck Wilhelm.....	1892
Schlesinger, Leopold Joseph.....	1912

NORTH CAROLINA.

<i>Albemarle.</i>	
Sutton, James Linwood.....	1916
<i>Bryson City.</i>	
Bennett, Kelly Edwin.....	1913
<i>Chapel Hill.</i>	
Beard, John G.....	1918
Howell, Edward Vernon.....	1900
<i>Charlotte.</i>	
Stowe, James Pinkey.....	1914
<i>China Grove.</i>	
Swaringen, DeWitt Clinton.....	1905
<i>Fayetteville.</i>	
Byrd, George.....	1917
Horne, Warren Winslow, Ph.C..	1902
<i>Hickory.</i>	
Hight, Macy S.....	1917
<i>High Point.</i>	
Matton, Geo. A.....	1916
<i>Morgantown.</i>	
Greyer, Charles Peyton.....	1912

NORTH CAROLINA—NORTH DAKOTA—OHIO.

<i>Oxford.</i>		<i>Lisbon.</i>	
Hays, Francis Banks.....	1902	Parker, Wm. S.....	1918
<i>Pittsboro.</i>		<i>Lakota.</i>	
Pilkington, George R.....	1916	Sjurseth, Oscar B.....	1918
<i>Raleigh.</i>		<i>McVile.</i>	
Hicks, Henry T.....	1916	Brakke, Nols N.....	1918
<i>Rocky Mountain.</i>		<i>Munich.</i>	
Briles, David Thomas.....	1916	MacDonald, Donald Boston....	1918
Rose, Ira Winfield, Ph.G.....	1912	<i>Page.</i>	
<i>Tarboro.</i>		Foss, Palmer L.....	1919
ZOELLER, EDWARD VICTOR.....	1878	<i>Sutton.</i>	
<i>Tryon.</i>		Hill, Homer L.....	1918
Missildine, Ernest Ellwood, A.B.	1910	<i>Towner.</i>	
<i>Wilmington.</i>		Koch, Louis Wm.....	1919
Gahn, Henry.....	1902	<i>Williston.</i>	
HARDIN, JOHN HAPWOOD.....	1881	Bradley, Ambrose Allen.....	1918
<i>Wilson.</i>		<i>Willow City.</i>	
Tarkenton, Edward Lawrence...	1912	Master, Walter.....	1909
<i>Winston-Salem.</i>			
Welfare, Sam E.....	1916		
		OHIO.	
NORTH DAKOTA.		<i>Akron.</i>	
<i>Bismarck.</i>		David, Ernest C., Ph.C.....	1913
Finney, Burt.....	1909	Howell, Ada Lee.....	1915
<i>Casselton.</i>		<i>Alliance.</i>	
Strehlow, H. R.	1918	Baier, Albert E.....	1918
<i>Devil's Lake.</i>		<i>Barnesville.</i>	
Engebretson, Elmer.....	1918	Ely, Ernest Sykes.....	1914
<i>Fairmount.</i>		<i>Bluffton.</i>	
Mergens, Peter.....	1918	Hauenstein, Armin Herrman....	1918
<i>Fargo.</i>		Hauenstein, Sidney.....	1913
Bentson, Bernard Leo.....	1909	<i>Bucyrus.</i>	
Cook, Roy Gould.....	1918	Farquhar, William.....	1916
Hallenberg, Oscar.....	1916	<i>Canton.</i>	
Porterfield, Wm. Perry, Ph.G....	1909	Antony, Charles W.....	1915
Schlichting, Arthur Floyd.....	1913	<i>Cincinnati.</i>	
Sudro, Wm. F.....	1918	Apmeyer, Charles Ascau.....	1906
<i>Finley.</i>		Betz, Otto E.....	1916
Needham, John W.....	1916	Blumenthal, Isadore F.....	1914
<i>Grafton.</i>		Bolte, Frank.....	1916
Haussamen, Henry Louis, Ph.G..	1906	Braubach, Charles.....	1918
<i>Grand Forks.</i>		Cain, Frank B., M.D.....	1914
Vold, John N.....	1916	Dannettelle, Leonore K. (Mrs.)..	1918
<i>Hankinson.</i>		De Courcy, Lydia.....	1913
Fowler, George Ross.....	1918	De Lang, Alfred.....	1915
<i>Kindred.</i>		Fennel, Charles Theo. P., Ph.G.,	
Strehlow, Max Henry.....	1916	<i>Phar.D.</i>	1886
		Foertmeyer, Chas. Geo., Dr....	1918

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Freericks, Frank Herman, Ph.G., LL.B.....	1905
Freiberg, Ralph.....	1918
GREYER, JULIUS.....	1880
Grothe, Frank Louis.....	1918
Heinemann, Edwin.....	1913
Heister, Louis.....	1914
Helmsderfer, John C.....	1919
Jones, Harold W.....	1913
Katz, Otto.....	1904
Ladrigan, John Paul.....	1918
Lakamp, William.....	1913
LLOYD, JOHN URI.....	1870
Merrell, Charles George, S.B....	1888
Minster-Ketter, Frederick John.	1913
Muehlberg, Victor Charles.....	1915
Murphy, Dennis E.....	1914
Ott, Bertha (Miss).....	1913
Schulz, Robert A.....	1916
Serrins, Geo.....	1918
Thiesing, Edward Henry.....	1912
Voss, Edward, Jr.....	1904
Waltermann, Henry B.....	1918
Werner, Louis.....	1913
Wetterstroem, Caroline (Mrs.)..	1914
Wetterstroem, Theodore David..	1897
Zuenkeler, John Ferdinand, Ph.G.	1887
<i>Cleveland.</i>	
Benfield, Charles William.....	1893
Cermak, Frederick Jefferson....	1916
Curtis, Morris E.....	1915
Flandermeier, August Louis, Ph.G.....	1910
Fox, Willard Milton.....	1903
Guenther, Harry F. J.....	1915
Hagemeister, Walter F.....	1918
Hankey, William Tabor.....	1902
Hechler, Edward Henry.....	1904
Hensge, William.....	1915
Herbkersman, Alma F. (Miss)...	1918
HOPP, LEWIS CHRISTOPHER.....	1876
Kepes, Joseph.....	1914
Kobylanski, John Francis.....	1918
Lehr, Frank P.....	1915
Muhlhan, Otto Emil.....	1905
Nesy, Albert.....	1916
Placak, Harry, Ph.G.....	1902
Pollock, Henry.....	1916

Pope, Alvah J.....	1919
Rabenstein, Edward, Jr.....	1915
Rauschfleisch, Edward C.....	1915
Reed, James Garfield.....	1909
Schoenhut, Christian Henry....	1888
Selzer, Eugene Reinhold, Ph.C...	1893
Sherwood, Henry Jackson.....	1894
Sollmann, Torald.....	1908
Sords, Thomas Vincent.....	1893
Spease, Edward, B.Sc., Ph.C....	1912
Spencer, Mary H.....	1916
Stockhaus, F. William.....	1916
Walleck, Andrew E.....	1915
Zickes, Elmer Joseph.....	1916
Zielinski, Max A.....	1918

Columbus.

Ackerman, Philip Jacob.....	1906
Bagley, Anna Gertrude.....	1912
Braun, Carl L.....	1915
Davy, Edward.....	1917
Dye, Clair Albert.....	1901
Ford, Myron Nile.....	1912
Hatton, Ellmore Wright.....	1894
Herpich, John Le Dure.....	1906
Kauffman, George Beecher.....	1882
Lee, Tachong.....	1919
Marckworth, Otto Stanley.....	1913
SCHUELLER, FREDERICK WILLIAM	1880
THURSTON, AZOR.....	1886
Topping, George Ballard, Ph.C..	1913
Webb, Edward Nathan.....	1905
Wendt, William Carl.....	1901
Wilfrid, Sister Mary.....	1915

Connecticut.

Stines, Geo. Findley.....	1918
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Dayton.

Jenkins, Elizabeth (Miss).....	1913
Jenkins, William R.....	1916

East Liverpool.

Holloway, Jesse Daniel, Ph.C....	1905
Wuensch, Henry Oscar.....	1916

Elyria.

Craine, Percy P.....	1908
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Glendale.

Igler, Herman E.....	1918
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Groveport.

Terry, Robert Wood.....	1915
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OHIO—OKLAHOMA—OREGON—PENNSYLVANIA.

<i>Lakewood.</i>		<i>Oklahoma City.</i>	
Pence, August Fred	1916	Howard, Searcy Bennett	1918
<i>Mulberry.</i>		Jarrett, Walter R.	1916
Wittkamp, Clarence T.	1915	<i>St. Anadarko.</i>	
<i>Norwood.</i>		Nichols, Clarence Van Buren	1915
Bruker, J. Harry	1918	<i>Stroud.</i>	
Peat, Clarence A.	1916	Burton, John Clement	1902
<i>Ravenna.</i>		<i>Weatherford.</i>	
Lyon, Harold Morgan	1919	Hudelson, F. H.	1914
<i>Sidney.</i>		OREGON.	
Christian, Forest D.	1916	<i>Albany.</i>	
<i>Springfield.</i>		Woodworth, D. Olin	1914
SIEGENTHALER, HARVEY NEW-		<i>Coquille.</i>	
TON	1882	Fuhrman, Cyrus Jacob	1915
Westenfelter, Chas. W.	1916	<i>Corvallis.</i>	
<i>Toledo.</i>		McWilliams, Hershel Brian	1918
Bowman, Waldo Moffet	1905	Ziefle, Adolph	1910
Loesser, Paul A.	1915	<i>Marshfield.</i>	
Ludwig, William Edward	1904	Brown, James Lee, Ph.G.	1903
Rupp, Walding G., Dr.	1918	<i>Portland.</i>	
Start, Ray C.	1915	Betzel, I. L.	1916
Ulen, Hamilton C.	1915	Byerley, Fabian	1909
<i>Wyoming.</i>		Clarke, Louis Gaylord	1909
Sanders, Harry Benjamin	1916	Haack, Rudolph George	1909
<i>Xenia.</i>		Koehler, William Francis	1909
Donges, Wm. H.	1914	Laue, John Max Alfred	1904
<i>Youngstown.</i>		McKellips, Clarence	1909
Cassaday, Orlin Ulysses	1899	Nau, Frank	1918
Putt, Earl B.	1914	Plummer, R. M.	1919
OKLAHOMA.		<i>Salem.</i>	
<i>Blair.</i>		Fry, Daniel Joshua	1917
Hawkins, Frank	1918	<i>The Dalles.</i>	
<i>Dewey.</i>		Blakeley, George Clarence	1892
Becker, Maxwell M.	1915	<i>Tillamook.</i>	
<i>Fort Sill.</i>		Clough, Charles Isaac	1915
Goheen, Ira Lee	1916	PENNSYLVANIA.	
<i>Hennessey.</i>		<i>Allentown.</i>	
Dinkler, Frank Adam	1900	Cole, John Northrup	1918
<i>Marshall.</i>		<i>Altoona.</i>	
Bridal, Velvie	1918	Burkett, K. S.	1915
<i>Mill Creek.</i>		Plette, G. W. Lloyd	1918
Akers, John W., Jr.	1916	Thomas, Joe Parks	1918
<i>Norman.</i>		<i>Ambler.</i>	
Browne, Howard S.	1918	Mattison, Richard V., M.D.	1913
De Barr, Edwin	1905	<i>Ashland.</i>	
		Schoenenberger, August	1919

PENNSYLVANIA.

<i>Berwick.</i>		<i>Elkins Park.</i>	
Heller, Theodore Rinehart.....	1917	Osborne, Melmoth Mercer.....	1906
<i>Bethlehem.</i>		<i>Forty-Fort.</i>	
Snyder, Harold Berlin.....	1918	Evans, W. E.....	1918
<i>Braddock.</i>		<i>Gallitzin.</i>	
Kutscher, George William.....	1905	Reed, John Edwin.....	1918
<i>California.</i>		<i>Germantown.</i>	
Hoffman, Philip.....	1918	Sarlo, Joseph.....	1918
<i>Carlisle.</i>		Youngken, Heber Wilkinson,	
Ehman, Jos. W.....	1918	A.B., A.M., Ph.G.....	1912
HORN, WILBUR FISK.....	1876	<i>Glenside.</i>	
<i>Carrick.</i>		Kohler, Charles.....	1913
Kuenzig, Peter A.....	1913	<i>Greencastle.</i>	
<i>Castle Shannon.</i>		Carl, Charles Blair.....	1910
Doyle, Joseph Jesse.....	1909	<i>Grove City.</i>	
<i>Center Hall.</i>		De France, George W.....	1910
Arney, Mabel F. (Miss).....	1918	<i>Haltby.</i>	
<i>Chester.</i>		Edwards, A. H.....	1918
Godlewski, Charles F.....	1919	<i>Harrisburg.</i>	
Hendrickson, Raymond.....	1916	Goodyear, Wilbur B.....	1915
<i>Clearfield.</i>		GORGAS, GEORGE ALBERT.....	1884
Bloom, Cecil Read.....	1917	Kramer, Charles F.....	1910
<i>Clifton Heights.</i>		Smith, Benjamin Franklin.....	1892
Duvorsin, Agnes (Miss).....	1916	<i>Hatboro.</i>	
<i>Columbia.</i>		Rothwell, Walter.....	1907
Zeamer, Harry Wisler.....	1905	<i>Hazeltown.</i>	
<i>Connellsville.</i>		Griesing, Howard Wm.....	1918
Keagy, Elwood Milton.....	1918	Henwood, Earl G.....	1918
<i>Coopersburg.</i>		<i>Hyndman.</i>	
Koch, Howard Jonathan.....	1916	Rhodes, Charles Reynolds.....	1918
<i>Cynwyd.</i>		<i>Kingston.</i>	
Campbell, S. Ross.....	1916	Banker, P. W.....	1918
<i>Dallas.</i>		Brown, Geo. W.....	1918
Norton, George.....	1918	Dinsel, Howard.....	1919
<i>Dorranctown.</i>		Ellsworth, Lynn.....	1918
Durbin, W. S.....	1919	Lohmann, John.....	1904
Meyers, Theodore.....	1919	Mazanski, Edw. C.....	1919
<i>Duncansville.</i>		Pritchard, F. R.....	1918
Robertson, John H.....	1918	<i>Kittanning.</i>	
<i>Easton.</i>		Eckbert, Charles Ryan.....	1917
Anspach, Paul Bucher, Ph.G....	1903	Sturgeon, Walter J.....	1914
Schlabach, Cyrus L.....	1914	<i>Lancaster.</i>	
<i>Eddystone, Delaware Co.</i>		Frailey, William Otterbein.....	1903
MORRIS, LEMUEL IOWORTH.....	1880	<i>Lebanon.</i>	
<i>Edwardsville.</i>		LEMBERGER, JOSEPH LYON, Ph.G.,	
Hatten, J. R.....	1918	Ph.M.....	1858
<i>Eldredsville.</i>			
Davis, W. B.....	1918		

PENNSYLVANIA.

<i>Luzerne.</i>		Cadmus, Robert Clark.....	1906
Haight, A.C.....	1918	Cahan, Samuel.....	1915
<i>Manheim, Lancaster Co.</i>		Campbell, Milton.....	1902
Ruhl, Harry Fry.....	1902	Campbell, Theodore.....	1902
<i>McKeesport.</i>		Cliffe, William Lincoln.....	1898
Schmidt, Adolph.....	1916	Cook, E. Fullerton, P.D.....	1901
<i>McKees Rocks.</i>		Cooley, Albert D.....	1916
Sandles, Van Amburg.....	1909	Cope, Frank Henry.....	1909
<i>Meadville.</i>		Cravens, John Goldsmith.....	1916
Utech, P. Henry, Ph.G.....	1907	Dean, J. Atlee.....	1914
<i>Miners Mills.</i>		Decker, Robert William.....	1907
Gott, W. J.....	1918	Dorfman, Rudolph K.....	1918
<i>Minersville.</i>		Eberle, Eugene Gustavus, Ph.M.	1896
Klitsch, Charles J.....	1919	Eberly, Karl K.....	1919
<i>Morristown.</i>		Ehmann, Karl Francis.....	1916
Breuer, James Edward.....	1915	England, Joseph Winters.....	1893
<i>Mt. Carmel.</i>		Eskin, Sarah.....	1918
Pachuta, Michael.....	1919	Ewe, George Elwood.....	1919
<i>New Castle.</i>		Evans, George Bryan.....	1902
Wallace, John Crawford, Phar.D.	1905	Fasnacht, Allen Hornberger...	1919
<i>New Cumberland.</i>		Ferguson, James A.....	1913
Good, Jacob Edison.....	1916	Fischelis, Robert Philip, Ph.G., Ph.C., B.Sc.....	1911
<i>Newport.</i>		Fisher, Henry, M.D.....	1916
Bosserman, Charles Emmett...	1918	Foran, Ralph Richard.....	1919
<i>New Sheffield.</i>		French, Harry Banks.....	1890
Bryson, William Smith, Ph.C., M.D.....	1905	French, Howard Barclay.....	1906
<i>North East.</i>		Friedman, William Leonard...	1918
Grandy, Seth Parker.....	1916	Gano, William Hubbell, Ph.G...	1892
<i>Ogontz.</i>		Garvey, James Aloysius, P.D...	1909
Clayton, Abram Theophilus....	1906	Gerhard, John.....	1916
<i>Oil City.</i>		Gershenfeld, Louis.....	1915
Gaddess, John.....	1908	Glass, Raphael.....	1919
<i>Pen Argyl.</i>		Gold, Maur George.....	1919
Worthington, John Warren Wolfe	1912	Goodhart, Brua Clifford.....	1918
<i>Philadelphia.</i>		Goodrich, Forest Jackson.....	1913
Apple, Franklin Muhlenberg, Ph.G., Phar.D.....	1905	Graham, Willard.....	1902
Baer, Jacob Michael.....	1902	Green, Samuel.....	1919
Baker, Benjamin.....	1919	Greenstone, Charles A.....	1916
Bernstein, Mitchell.....	1918	Griffith, Ivor.....	1916
Blackwood, Russell Thorn.....	1907	Hahn, Edward T.....	1918
Blair, Henry Cowan.....	1907	Hall, Wm. Daniel.....	1915
Bongiovanni, Joseph Nathaniel..	1916	Hance, Anthony Miskey.....	1902
BORING, EDWIN McCURDY.....	1867	Harbold, Curtis Alexander.....	1907
Brinton, Clement Starr.....	1907	Harrison, Joseph Whipple Eu- gene.....	1918
Busch, Henry Paul.....	1910	Haussman, Frederick William...	1895
Busch, Miers.....	1903	Hessler, Elmer H.....	1914

PENNSYLVANIA.

Hires, Charles E.....	1916	Peacock, Bertha Leon (Mrs.),	
Hoch, Quintus.....	1907	Ph.G.....	1895
Hoffman, Charles Elbert.....	1917	Peacock, Josiah Comegys, Ph.G.	1892
Hoffman, E. Grace.....	1916	Pearson, William Alexander....	1908
Huber, Donald Witherow.....	1918	Pittenger, Paul Stewart, Ph.G.,	
Hughes, Francis Stacker.....	1902	Ph.C., Phar.D.....	1911
Hunsberger, Ambrose.....	1905	Poley, Warren Henry.....	1906
Ikan, Albert L.....	1916	Rabinowitz, Abraham.....	1918
Jaffe, Hyman.....	1919	Rapoport, Julius G.....	1918
Jones, Amos.....	1915	Reese, David J.....	1915
Kahn, Solomon Karl.....	1905	Rehfuss, Charles.....	1908
Kendig, H. Evert.....	1916	Reif, Ernest.....	1915
Kercher, Edwin Harry, Ph.G....	1907	Roberts, John Griffith.....	1914
Kirby, Charles P.....	1909	Roddy, John A., M.D.....	1916
Kline, Clarence Mahlon, Ph.B....	1902	Rohrman, Frank Randall.....	1915
Klopp, Henry L.....	1913	Rosenberg, Julius Jacob.....	1918
Koenig, Otto L., Jr.....	1919	Rosengarten, Adolph G.....	1913
Koerber, Charles Jacob.....	1915	Rosengarten, Frederick.....	1913
Lackey, Richard Henry.....	1907	Rosengarten, George David....	1902
Lantz, William Henry.....	1908	Rosengarten, J. G.....	1913
LaWall, Charles Herbert, Ph.M....	1896	Rosin, Joseph.....	1914
LaWall, Millicent Renshaw		Seidman, Harry.....	1911
(Mrs.), P.D.....	1905	SHOEMAKER, RICHARD MARTIN..	1865
Leedom, Charles.....	1902	Siegfried, Howard J.....	1907
Mallard, Oscar Paul.....	1916	Simpson, Nathan Alexander....	1916
Margerum, Donald Cameron....	1918	Simpson, Robert.....	1913
Matusow, Harry, Ph.G.....	1897	Smith, Howard E.....	1910
McClure, Maurice Axe.....	1919	Smith, Walter Valentine.....	1902
McNeary, Wm. Wilson.....	1915	Staudt, Albert John.....	1907
McNeil, Robert.....	1907	Stein, Milton.....	1918
Meeker, George Herbert, B.S.,		Stewart, Francis Edward.....	1884
M.S., Ph.D., Phar.D., D.D.S.,		Strawinski, J. Frank.....	1917
LLD.....	1905	Streep, Frank Park.....	1907
Mellor, Alfred.....	1864	Stroup, Freeman Preston, Ph.M.	1900
Menger, Ruth Caroline.....	1918	Subin, Israel.....	1918
MILLER, ADOLPHUS WILLIAM,		Swan, Edwin Garner.....	1919
Ph.G., M.A., Ph.D.....	1868	Thum, John Karl, Ph.G.....	1905
Minehart, John Roy.....	1905	Wall, C. LeRoy.....	1918
Moerk, Frank Xavier, Ph.G.,		Wallace, George R.....	1914
Ph.M.....	1898	Wear, John.....	1918
Moran, Rose.....	1919	WEIDEMANN, CHARLES ALEXAN-	
Morgan, Frank E., Ph.G.,		DER, Ph.G., M.D.....	1868
Phar.D.....	1906	Weisner, Nicholas Frederick...	1909
Nebig, William George, Ph.G....	1907	White, Robert C.....	1918
Nichols, Adley Bonisteel.....	1918	Wood, Horatio C., Jr., M.D....	1906
Novack, Harry J., M.D.....	1916		
Osterlund, Otto William.....	1902	<i>Pittsburgh.</i>	
Pachali, Theodore, Jr.....	1907	Bluestone, Isadore.....	1916
		Blumenschein, Frederick John...	1904

PENNSYLVANIA.

Darbaker, Leasure Kline, Ph.G., Phar.D.....	1909	<i>Rochester.</i>	Hamilton, Mary R. (Miss).....	1914
Easley, H. Francis.....	1918	<i>Scranton.</i>		
EMANUEL, LOUIS.....	1878	Brown, Andrew.....	1915	
Gilleland, John Roy.....	1914	Gardier, Louis.....	1919	
Giusti, Dante A.....	1918	Knoepfel, William Henry.....	1909	
Janda, Thomas John Joseph....	1913	<i>Sharpsville.</i>		
Judd, Albert Floyd.....	1901	McNerney, Michael Francis....	1918	
Koch, Julius A.....	1892	<i>Sheffield.</i>		
Kossler, Herman Stanislaus....	1905	Mayer, Harry O.....	1919	
Kretz, Edward John.....	1909	<i>State College.</i>		
Lohmeyer, Henry L.....	1910	Russell, C. Allen.....	1918	
McNulty, James Cleland.....	1909	<i>Sunbury.</i>		
Mierzwa, Richard.....	1908	Dupree, George.....	1919	
Miller, Joseph J.....	1918	<i>Titusville.</i>		
Newton, Robert Albro.....	1906	Condra, James O'Brien.....	1919	
Pritchard, Benjamin Elliott....	1908	<i>Towanda.</i>		
Rodemoyer, William Edward....	1901	PORTER, HENRY CARROLL.....	1872	
Saalbach, Carl, Ph.G.....	1908	<i>Tremont.</i>		
Saalbach, Louis, Ph.G., Phar.D.	1907	Schultz, Anna.....	1918	
Sauer, Leafy A. (Miss).....	1918	<i>Trevorton.</i>		
Schaefer, Charles Henry, Ph.G.	1909	Smith, William M.....	1918	
Schaefer, Emil August, Phar.D.	1900	<i>Uniontown.</i>		
Thompson, John Reynolds.....	1905	Zacovic, Andrew.....	1918	
Walter, Peter Grant, Ph.G., Phar.D.....	1905	<i>Washington.</i>		
Webber, Daisy B. (Mrs.).....	1918	Vowell, Louis Sweitzer.....	1905	
Weimer, Roth Eardon.....	1918	<i>Wayne.</i>		
Wittmer, Robt. S. R.....	1915	Mulford, Henry Kendall.....	1896	
Wolfe, Joseph Albert.....	1916	Mulford, Henry Kendall, Jr....	1916	
Wurdach, John Herman.....	1909	<i>W. Pittston.</i>		
<i>Pittston.</i>		Evans, Samuel Morgan.....	1918	
Kane, James F.....	1919	<i>Wilkes-Barre.</i>		
<i>Plymouth.</i>		Ahrendts, C. H.....	1919	
Durbin, George J.....	1919	Aston, E. Arthur.....	1919	
Evans, Thos. J.....	1919	Bennett, J. R.....	1918	
Grobelewski, G.....	1919	Berg, Leroy.....	1918	
Harris, Richard.....	1919	Bossert, Henry.....	1918	
Hartman, Stephen C.....	1919	Burke, Mark.....	1919	
Hughes, Harry C.....	1919	Crاندall, Fred J.....	1919	
Roon, Patrick A.....	1919	Drapewski, B.....	1919	
<i>Port Royal.</i>		Edwards, William.....	1919	
Heckerman, Adam B.....	1915	Filar, Louis L.....	1919	
<i>Pottsville.</i>		Frank, Louis.....	1914	
Deibert, Thomas Irwin.....	1882	Gallagher, G. J.....	1918	
<i>Reading.</i>		Gannon, Edward P.....	1919	
Ziegler, Howard Philip.....	1905	Gibbons, George, Jr.....	1919	
		Gillespie, H. L.....	1919	
		Gray, Minot E.....	1919	

PENNSYLVANIA—PHILIPPINE ISLANDS—PORTO RICO—RHODE ISLAND—SOUTH
CAROLINA—SOUTH DAKOTA.

Green, W. V.....	1918
Greenstein, Norris.....	1918
Hileman, Fred D.....	1919
Hufford, H. S.....	1918
Kijanski, Leo.....	1919
Mebane, R. Ramsay.....	1919
Morgan, Ashton H.....	1919
Morgan, Jos. D.....	1918
Owens, Evan R.....	1918
Ricketts, John C.....	1918
Rooney, James P.....	1919
Shales, Martin.....	1918
Shovelin, John J.....	1919
Swainsbank, H. H.....	1918
Tuck, Henry C.....	1919
Walters, W. J.....	1918
White, W. D.....	1918

Wilkinsburg.

Truby, Miriam Grace (Miss)....	1914
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Williamsport.

CORNELL, EDWARD AUGUSTUS, Ph.C.....	1873
Walton, Lucius Leedom, Ph.G., Ph.M., Phar.D.....	1904

Wilson.

Blank, Herman Gustave, Jr., Ph.D.....	1905
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Wrightsville.

Fitzkee, Hastings.....	1918
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Wyoming.

Gregory, H. T.....	1918
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York.

Leber, Jacob Gilbert.....	1905
Shearer, George Keyworth.....	1917

PHILIPPINE ISLANDS.

Manila.

Imson, Juan Rosales.....	1916
Zamora, Manuel, Sgt. 1st Cl., H.C., U. S. A.....	1908

PORTO RICO.

Ceiba.

Salinas, Miguel Saavedra.....	1918
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Fajardo.

Veve, Miguel A.....	1918
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Mayaguez.

Mulet, Luis.....	1918
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San-Sebastian.

Cabrero, Narcisco Rabell.....	1915
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RHODE ISLAND.

Narragansett Pier.

Davis, Peter Bernard.....	1909
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Newport.

Downing, Benjamin Franklin...	1886
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Pawtucket.

Brennan, James Edward.....	1909
Morgan, George Smith.....	1909

Providence.

Anthony, Edwin Perkins.....	1909
Blanding, William Oliver.....	1894
Clafin, Albert Whitman.....	1913
Colton, Edward Thomas.....	1909
Corrigan, Michael Henry.....	1913
Haynes, Herbert.....	1908
Parker, Gilbert Richie.....	1910
Pearce, Howard Anthony.....	1894
Reiner, Nicholas F.....	1913

SOUTH CAROLINA.

Camp Wadsworth.

Chase, Walter M.....	1915
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Charleston.

Eidson, Frank Vinton.....	1917
Hyde, Joseph Bell, Jr., Ph.G....	1909
Jordan, John M.....	1916
Plenge, Henry.....	1910
Zeigler, Washington Hayne.....	1915

Greenwood.

Coleman, Arno A.....	1916
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Pickens.

Yongue, James Douglas.....	1918
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Woodruff.

Gaddy, Robert Litson.....	1918
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SOUTH DAKOTA.

Bonesteel.

Kenaston, Hampton Ray, B.E., M.E. (Mrs.).....	1914
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Bowdle.

Maas, Henry Conrad.....	1910
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Brookings.

Hogstad, Anton, Jr.....	1918
Locke, Charles A.....	1918

Centerville.

Heisler, John Emery.....	1910
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SOUTH DAKOTA—TENNESSEE—TEXAS.

<i>Conde.</i>		<i>Humboldt.</i>	
Ross, Otto Ellsworth, Ph.C.,		Nooner, Thompson A.....	1914
Ph.G.	1908	<i>Jackson.</i>	
<i>Dell Rapids.</i>		Nance, O. J.	1916
Bent, Edward Clarence.....	1915	<i>Johnson City.</i>	
<i>Estelline.</i>		Whitehouse, Harry.....	1917
Hoffelt, Edward.....	1910	<i>Knoxville.</i>	
<i>Hot Springs.</i>		Brown, Frank S.....	1914
Highlye, L. E.....	1913	Rosenthal, David Abraham,	
<i>Lead.</i>		Ph.G.....	1894
Brown, Floyd Woodford.....	1910	<i>Memphis.</i>	
Hazeldine, Earl L.....	1918	Crowe, Robert Latta.....	1914
<i>Mitchell.</i>		ROBINSON, JAMES SCOTT.....	1869
Scallin, Stephen Harmon.....	1910	Sheel, Edward Valentine.....	1918
<i>Mobridge.</i>		Sparks, Edgar B.....	1918
Olson, Ferdinand P.....	1910	Wright, Eugene Ware.....	1918
Swartz, Geo. F.....	1909	<i>Nashville.</i>	
<i>Pierre.</i>		Clark, Ira Benton.....	1909
Vilas, Fred L.....	1918	Hubbard, George Whipple.....	1913
<i>Redfield.</i>		McGill, John Thomas.....	1900
Pool, James Arthur.....	1918	Pully, Luther Smith.....	1910
<i>Sioux Falls.</i>		Ruddiman, Edsel Alexander,	
Bernhart, Peter Kristoffer, Ph.G.,	1910	Ph.C., Ph.D., M.D.....	1894
Dunning, L. T.....	1918	Schott, Ernest John.....	1917
<i>Springfield.</i>		Smith, Frank Leslie.....	1910
Walpole, Robert E.....	1918	Weise, Carl E.....	1914
<i>Watertown.</i>		White, William Rufus, Ph.C....	1904
Jones, David Franklin.....	1895	Winter, William Patrick.....	1917
Zieske, Arthur, Ph.G.....	1910	Young, Clarence C.....	1910
<i>Webster.</i>		<i>Newbern.</i>	
Halbkat, Franklin W.....	1916	Westbrook, Charles Gray.....	1912
<i>Winchester.</i>		<i>Sharon.</i>	
Prince, Clofton O.....	1914	Shannon, Thomas J.....	1905
TENNESSEE.		<i>Smithville.</i>	
<i>Chattanooga.</i>		Mason, Harlin Eggleston.....	1918
Voight, Joseph Frederick.....	1893	TEXAS.	
<i>Clarksville.</i>		<i>Austin.</i>	
Coulter, George W.....	1917	Graham, J. W.....	1916
<i>Decherd.</i>		Neville, Wm. R.....	1918
Bass, Francis Marion.....	1913	<i>Ballinger.</i>	
<i>Dyersburg.</i>		Weeks, John A.....	1916
Jacocks, John T.....	1913	<i>Bellville.</i>	
Lipscomb, W. L.....	1914	Carter, Quintus Elton.....	1919
<i>Harriman.</i>		<i>Bomarton.</i>	
Yeargan, Regan Lawrence.....	1914	Seydler, Robert.....	1910
<i>Henning.</i>		<i>Brownsville.</i>	
Turner, Thomas David.....	1918	Willman, William George.....	1904

TEXAS.

<i>Crockett.</i>		<i>Houston.</i>	
Bishop, William Penn.....	1914	Burgheim, Jacob.....	1892
<i>Dallas.</i>		Dwyer, Frank B.....	1915
Atkinson, C. W.....	1918	<i>Italy.</i>	
Beukma, Cornelius.....	1915	Jenkins, Cecil Lester.....	1916
Carson, Charles E.....	1918	<i>Lockhart.</i>	
Cason, Charles E.....	1918	Westmoreland, Edwin Reese,	
Coulson, James Thomas.....	1906	Ph.G.....	1910
Cousins, Walter Henry.....	1915	<i>Lubbock.</i>	
De Lorenzi, Albert.....	1890	Duering, Henry Charles.....	1901
Donald, Lee Otis.....	1919	<i>Manor.</i>	
Duncan, C. A.....	1917	Wentland, William Henry.....	1914
Fletcher, Joel Morgan.....	1915	<i>McKinney.</i>	
Harrell, Eldridge Columbus.....	1919	Dulaney, Joseph Field, P.D.....	1902
Hilterbrand, Enos Alexander....	1916	<i>New Braunfels.</i>	
Long, Eugene Hughes.....	1919	Schumann, Henry Valentine....	1911
Marvin, Z. E.....	1916	<i>Paris.</i>	
Mitchell, Lloyd Benjamin.....	1912	Snell, Tom J.....	1916
Patteson, James Wilburn.....	1918	<i>Poth.</i>	
Rogers, Russel V.....	1918	Bomba, Onufry Joseph.....	1910
Urbish, A. J.....	1918	<i>Richardson.</i>	
<i>Dilley.</i>		Harben, Sam P.....	1918
Breining, M. H.....	1916	<i>Remlig.</i>	
<i>Eagle Pass.</i>		Clark, Willis Anthony.....	1918
Carson, Roger L.....	1918	<i>San Angelo.</i>	
<i>El Paso.</i>		Buttery, Lester Le Roy.....	1916
Calderon, Guillermo.....	1918	<i>San Antonio.</i>	
Ryan, Ambrose Eugene.....	1907	Burns, William Carroll.....	1917
<i>Encinal.</i>		Dreiss, Hermann E. F., Ph.G....	1912
Guerrero, Juan Cantu.....	1911	Fischer, Albert Martin.....	1915
<i>Farmersville.</i>		Hein, Henry F.....	1918
Rike, Zeb W.....	1916	Nester, Herman August.....	1909
<i>Forney.</i>		Pfeiffer, John.....	1918
Adams, Walter Dickson.....	1913	Prassel, Frank.....	1919
<i>Galveston.</i>		Schoenholzer, Emil.....	1917
Buckner, John Clark.....	1905	Staffa, August E.....	1915
Geisenberger, Abe H., Jr.....	1917	<i>San Marcos.</i>	
Gleason, David J.....	1916	Shipe, Columbus A. (Miss).....	1914
Koester, Hermann.....	1910	<i>Simonton.</i>	
Wilder, Gaston H.....	1916	Rabinowitz, Wm. Joseph.....	1915
<i>Gonzales.</i>		<i>Taylor.</i>	
Brenner, Louis C.....	1917	Carleton, Henry Lincoln.....	1910
Walker, Robert Hamilton, B.S.,		<i>Texline.</i>	
Ph.M.....	1907	Dyche, Wm. E.....	1915
<i>Hallettsville.</i>		<i>Wichita Falls.</i>	
Saccar, Michael, Ph.G.....	1905	Brown, Robert Owen.....	1914
		<i>Yoakum.</i>	
		Koerth, Emil Christian.....	1910

UTAH—VERMONT—VIRGINIA.

UTAH.		<i>East Radford.</i>	
<i>Brigham.</i>		Hopkins, Robert Smith.....	1919
Eddy, Wynn Leland.....	1908	<i>Hampton Roads.</i>	
<i>Logan.</i>		Dennis, Edward G.....	1919
Riter, Benjamin Franklin.....	1910	Lawrence, John Noble.....	1919
<i>Ogden.</i>		Zembsch, Laurence.....	1919
Culley, John, Ph.G.....	1908	<i>Harrisonburg.</i>	
<i>Salt Lake City.</i>		Avis, James Little.....	1905
Dayton, Walter Henry, Ph.G....	1908	<i>Leesburg.</i>	
Harms, Herman E.....	1908	Littlejohn, Horace.....	1918
Swingle, Leroy Dey.....	1917	<i>Norfolk.</i>	
VERMONT.		Kimball, Chester Orvis.....	1916
<i>Barton.</i>		Murdy, William Fletcher, D.D.S.	1916
Pierce, Fred D.....	1909	Nelligar, Frederick Dennis.....	1907
<i>Brattleboro.</i>		Taylor, Thomas Ramsay.....	1913
Root, Wilfred F.....	1912	<i>Petersburg.</i>	
<i>Burlington.</i>		Knock, Thomas Franklin.....	1911
Luck, Louis H.....	1915	<i>Portsmouth.</i>	
Zottman, Wm. H.....	1918	Schreurs, H. B., H. S., U. S. N..	1917
<i>Marshfield.</i>		<i>Pulaski.</i>	
Gilman, Elbridge Wheeler.....	1907	Seagle, Dexter E.....	1918
<i>Montpelier.</i>		<i>Richmond.</i>	
Slade, Henry Allen.....	1899	Bolenbaugh, Albert.....	1909
<i>Morrisville.</i>		Brandis, Ernest Linwood.....	1906
Cheney, Arthur Lewis.....	1907	Briggs, Andrew Gessner.....	1890
<i>N. Ferrisburg.</i>		Curd, Thomas Nelson.....	1907
Clafin, Walter Addison.....	1896	Johann, Adam Ernest.....	1910
<i>Rutland.</i>		Lichtenstein, Julian.....	1918
McClallen, E. Gregory.....	1912	Miller, Turner Ashby, Ph.G....	1894
<i>St. Johnsbury.</i>		Monroe, Roger E.....	1918
BINGHAM, CHARLES CALVIN....	1875	Parker, Ray M.....	1919
Eastman, Welcome B.....	1912	Phipps, Morris.....	1917
<i>Windsor.</i>		Rudd, Wortley Fuller.....	1915
Skinner, Charles Herbert.....	1914	Taylor, Edgar Darby.....	1910
Skinner, Oakley Smith.....	1915	Walker, Charles F.....	1919
<i>Virgin Island.</i>		Wilson, Eugene C.....	1919
Davis, Brooke John.....	1917	Wood, Carroll E.....	1918
VIRGINIA.		<i>Roanoke.</i>	
<i>Altavista.</i>		Lambert, Maud, Ph.G.....	1915
Brugh, Ewell Ashby.....	1918	<i>Shenandoah.</i>	
<i>Bedford City.</i>		Hudson, Edgar Yager.....	1918
Lyle, Walter L.....	1918	<i>Tazewell.</i>	
<i>Chatham.</i>		Jackson, John Edward.....	1918
Thompson, G. E.....	1918	Martin, Thomas Fairfax.....	1919
<i>Culpepper.</i>		<i>Woodstock.</i>	
Goldsborough, Charles Henry...	1898	Clower, Joseph B.....	1919

WASHINGTON—WEST VIRGINIA—WISCONSIN.

WASHINGTON.

<i>Colfax.</i>	
McCroskey, Virgil T.....	1915
<i>Connell.</i>	
Garrison, Dayton Burt, Jr.,	
Ph.G.....	1913
<i>Port Townsend.</i>	
O'Gorman, Theophilus Vincent..	1897
<i>Puyallup.</i>	
Truedson, Eric P.....	1904
<i>Seattle.</i>	
Blalock, Jesse Nelson.....	1909
Hindman, Frances Edith, Ph.C.,	
M.S. (Miss).....	1915
HOLMES, HENRY ELLIOTT.....	1880
Johnson, Charles Willis, Ph.C.,	
B.S., Ph.D.....	1903
Linton, Arthur Wilson.....	1901
McGogy, James Frank.....	1915
McLean, James Walter.....	1911
McTague, Edward Joseph.....	1913
Osseward, Cornelius, Ph.C.....	1897
Rubenstein, Louis.....	1909
Watson, Joseph Ryerson, Ph.C..	1904

Spokane.

Bartley, Deane C.....	1918
Duerfeldt, Henry George.....	1916
McRay, Emily C. (Mrs.).....	1915
Whitlock, William Thomas.....	1915

Tacoma.

Faulkner, John William.....	1918
Marr, Fred D.....	1915
Rein, Tania.....	1910

Vancouver.

Dewey, Albert Haskin, Ph.G.,	
B.S., M.S.....	1909

Wilbur.

Bandy, George, Ph.G.....	1905
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WEST VIRGINIA.

Bluefield.

Goodykoontz, Charles Henry....	1909
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Buckhannon.

Young, George Orville, Ph.G....	1907
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Charleston.

Krieg, Arch.....	1916
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Clarksturg.

Haymaker, Frank Berkshire....	1906
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Harper's Ferry.

Dittmeyer, Walter E., P.D.....	1907
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Huntington.

Rhea, Howard M.....	1914
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Morgantown.

Bergy, Gordon Alger.....	1917
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Dent, Gaylord Hess.....	1915
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Moore, W. H.....	1915
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Wood, Frank Davidson.....	1915
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Petersburg.

Judy, J. N., M.D.....	1916
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Sutton.

Walker, Alfred.....	1905
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Welch.

Downs, Bertis E.....	1913
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Wellsburg.

Elson, John R.....	1918
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Wheeling.

Baer, Herbert O.....	1916
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Coleman, John.....	1905
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Graham, John Russell.....	1916
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Irwin, William Wilson.....	1914
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WISCONSIN.

Eau Claire.

Boberg, Otto Johan Sinius.....	1913
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Fond du Lac.

Kremer, Berthold James.....	1913
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Hudson.

Mickelsen, Henry C.....	1918
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Jefferson.

Fischer, Ray Otto.....	1911
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La Crosse.

BEYSCHLAG, CHARLES.....	1880
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Madison.

Bergstein, Leonard.....	1919
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Fischer, Richard, Ph.D.....	1901
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KREMERS, EDWARD, Ph.G.,	
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Ph.D.....	1887
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Langenhan, Henry August.....	1908
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Lewis, Henry.....	1908
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MILLER, EMERSON ROMEO.....	1895
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Richtmann, William Oscar, Ph.G.,	
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B.S.....	1904
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Wakeman, Nellie A.....	1918
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Williams, Edward, Ph.C., P.S.,	
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M.S., Phar.M.....	1906
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WISCONSIN—WYOMING—ALBERTA—MANITOBA—NEW BRUNSWICK—ONTARIO
QUEBEC—SASKATCHEWAN.

Milwaukee.

Alberts, M. Lee	1912
Bodinus, Edmund	1919
Eberle, A. Ralph	1918
Eckstein, Solomon A.	1912
Graw, Paul	1912
Keating, Frank	1914
Kettler, Edward, Jr.	1896
Kochanski, Edmund H. J.	1918
Krembs, Ernest Maximilian	1903
Lange, Leonard A.	1913
Possehl, John J.	1918
Raeuber, Edward Gottfried, Ph.G.	1900
Ruenzel, Henry Gottfried	1892
SCHRANK, CHARLES HENRY	1876
Thatcher, Edmond Sheldon	1917
Urban, Leopold Charles	1912

Neillsville.

SNITEMAN, CHARLES CLARENCE	1881
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Oconomowoc.

Peters, Henry August, M.D., Ph.G.	1903
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Racine.

Horlick, Alexander James	1904
Horlick, William	1913
Horlick, William, Jr.	1913

Reedsburg.

Mueller, Frank F.	1911
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Thiensville.

Seyfert, Paul	1909
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Watertown.

Eberle, Herman Theodore	1901
-------------------------	------

Wausau.

Albers, William W.	1909
--------------------	------

WYOMING.

Cheyenne.

Roedel, Andrew Edward	1919
-----------------------	------

Laramie.

Beath, Orville Andrew	1919
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DOMINION OF CANADA.

ALBERTA.

Edmonton South.

Gaetz, Halley Hamilton	1918
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MANITOBA.

Winnipeg.

Bletcher, Henry Ernest John	1904
Campbell, Charles William	1910
Colcleugh, Murray Chrisholm	1913
Connell, Thomas A.	1915
Harrison, George Waller	1914
Nesbitt, Evelyn	1910

NEW BRUNSWICK.

New Castle.

McCormick, Percy Maurice, Ph.G.	1916
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ONTARIO.

Guelph.

Stewart, Alexander	1905
--------------------	------

Ottawa.

McGill, Anthony	1918
Watters, Henry	1912

Stratford.

WAUGH, GEORGE JAMES	1862
---------------------	------

Toronto.

Heebner, Charles Frederick	1894
Hurst, Robert Oscar	1916

QUEBEC.

Montreal.

Moore, Alexander Benjamin Journeaux	1914
Tansey, Owen Hilary	1915
<i>St. Agathe Des Monts.</i>	
St. Amour, Omer	1915

Three Rivers.

Williams, John Lewis, Doctor Optics	1909
--	------

Westmount.

Frosst, Charles E.	1919
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SASKATCHEWAN.

Saskatoon.

Campbell, Alexander	1914
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SANTO DOMINGO.

Republica Domini.

Castro, A. Rodriguez.....	1918
Oca, Rene R.....	1919
Rodrigueza, Rene.....	1918

CUBA.

Artemisa.

Gavalda, Milanes Antonio.....	1918
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Bayamo.

Tamayo, Silverio A.....	1918
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Cruces.

Prieto, Jose Ramon.....	1915
Vidal, Carlos, Phar.D.....	1916

Havana.

Abreu, Gerardo Fernandez.....	1907
Alacan, Jose P., Phar.D.....	1911
Alacan, Sylvia C.....	1916
Bosque, Arturo.....	1907
Bustillo, Dra Sarah (Miss).....	1917
Calonge, Luisa (Miss).....	1916

Capote, Jose.....	1907
Coll, Paula.....	1916
Delgado, Joila Estrella, M.D....	1915
Delgado y, Valdes Emiliano.....	1918
Diaz, José Guillermo.....	1907
Faundo, Eduardo Garcia.....	1915
Goltz, Carl Julius.....	1915
Hernandez, Cartaya J.....	1907
Johnson, Manuel.....	1907
Johnson, Theodore, M.D.....	1911
Llarena, Maria Gonzales y.....	1913
Pazosy, Boada Felipe.....	1916
Remirez, Prof. Francisco.....	1912
Taquechel, Francisco.....	1908

Manzanillo.

Vasquez, Carlos, R.V., M.D.....	1914
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Media Luna.

Sanchez, Miguel.....	1919
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Santa Clara.

Valdez, Jose E. Fernandez y....	1919
---------------------------------	------

Santiago.

Berengner, Jose M.....	1918
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MEMBERS RESIDING IN FOREIGN COUNTRIES.

(Except Canada and Cuba.)

Abert, Moses Mordechai, B.A., B.C., M.Ph.m., Beirut, Syria, Turkey....	1916
Andrade, Cesar Daniel, Guayaquil, Equador, S. A.....	1918
Chapman, Oswald, Panama City, Panama.....	1916
Fong, Job, Canton, So. China.....	1913
Gonzales, Teodoro M. Guiterrez, Barranquilla, Columbia, S. A.....	1915
Gonzales, y Jones Jose A., Columbia, S. A.....	1915
Hallaway, Robert Railton, B.Sc., Ph.D., Carlisle, England.....	1905
Heuschling, Allen J., London, England.....	1918
Jee, S. H., Dr., Macaw, Japan.....	1918
Jurado, Bolivar, Ph.C., Ph.B., Panama City, Panama.....	1915
Ladakis, Triantaphylle, Beirut, Syria.....	1907
McMullin, David John, H. S., U. S. N., Pago Pago, Tutuilla, American Samoa.....	1916
Murray, Alexander, San José de Costa Rica, C. A.....	1903
Patch, James Alfred, Beirut, Syria.....	1903
Permanda, Das., Calcutta, India.....	1918
Pirie, Alfred Mitchell, Cartago, Costa Rica, C. A.....	1903
Tesche, Hjalmar Gustaf Anderson, Soedertelje, Sweden.....	1919
WELLCOME, HENRY SOLOMON, London, England.....	1875
Wooyenaka, Keizo, Tokio, Japan.....	1907

LIST OF MEMBERS WHO HAVE DIED SINCE THE PUBLICATION OF THE 1916 YEAR BOOK.

February 1, 1918, to April 24, 1919.

Deceased.	Residence.	Elected.
Block, Mitchell.....	Excelsior Springs, Mo.....	1919
Boyd, Hugh Lee.....	Kosciusko, Miss.....	1916
BURGE, JAMES OSCAR.....	Nashville, Tenn.....	1878
Cooper, James W.....	Plymouth, Mass.....	1909
Correll, Eugene P.....	Eureka, Calif.....	1909
Dare, Chas. F.....	Bridgeton, N. J.....	1889
Deck, Lewis C.....	Girard, Ill.....	1901
DEWOODY, WM. LAWRENCE.....	Pine Bluff, Ark.....	1887
Drake, Charles.....	Woodbridge, N. J.....	1915
DUNN, JOHN A.....	Brooklyn, N. Y.....	1867
Fack, Rudolph.....	Cincinnati, Ohio.....	1913
Fuller, Charles.....	Chicago, Ill.....	1918
Gallagher, John Charles.....	Jersey City, N. J.....	1893
Hall, Joseph P.....	Suffolk, Va.....	1900
Haney, Edward R.....	Philadelphia, Pa.....	1918
Heidbreder, Albert H.....	Quincy, Ill.....	1905
Hodges, Jesse D.....	Little Rock, Ark.....	1915
HUESTED, ALFRED B.....	Delmar, N. Y.....	1879
Jackman, Wilber F.....	Detroit, Mich.....	1899
Kahn, Joseph.....	Brooklyn, N. Y.....	1915
Kleinau, Geo.....	New York, N. Y.....	1911
Kramer, Julius.....	Rochester, N. Y.....	1915
Latham, Thomas.....	New York, N. Y.....	1900
LEIS, GEO.....	Lawrence, Kans.....	1869
Lutz, Carl William.....	Ottawa, Ill.....	1918
Maisch, Henry.....	Baltimore, Md.....	1898
Mansfield, Samuel.....	Baltimore, Md.....	1898
Martin, Joel F.....	Bourdon, Ind.....	1918
Mayer, Peter.....	Marshalltown, Ia.....	1906
Miller, Clifford O.....	Baltimore, Md.....	1912
Miller, William L.....	Saginaw, Mich.....	1915
Morris, Max.....	Macon, Ga.....	1898
Niece, Fred E.....	New York, N. Y.....	1903
PATTON, JOHN F.....	York, Pa.....	1880
Pegg, Harry W.....	Kingston, Pa.....	1908
Peters, Thos. H.....	Plains, Pa.....	1919
Robertson, David.....	Governor's Island, N. Y.....	1912
Rupp, Peter.....	Algiers, La.....	1915
Schapper, Ferdinand.....	Chicago, Ill.....	1913
Schmidt, Fred M.....	Chicago, Ill.....	1887
Shulmyer, Charles Joseph.....	Providence, R. I.....	1915
Talbott, W. A.....	Warren, Pa.....	1913
Timmons, Geo. D.....	Valparaiso, Ind.....	1905
VORDICK, AUGUST H.....	St. Louis, Mo.....	1874
Walker, Joseph P.....	New Orleans, La.....	1909
Wolf, Michael F.....	Baltimore, Md.....	1906
ZIEGLER, PHILIP M.....	Reading, Pa.....	1867

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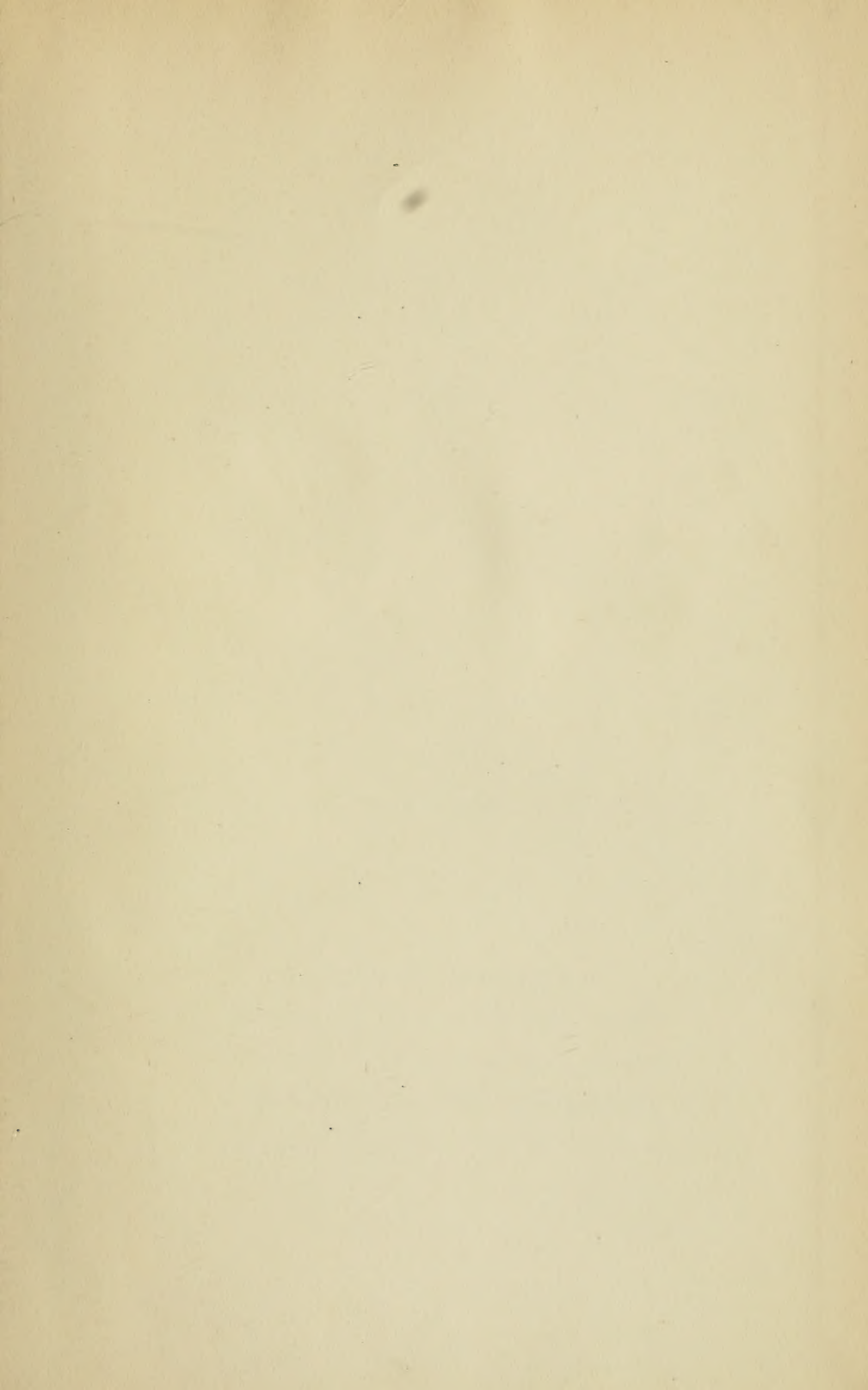
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